Chaetodon strigangulus

Chaetodon? strigangulus, Solender.

Chaetodon strigangulus, Solender, M.S.
" " Bennett et Lay, Zool. Voy. Blossom, Fishes, p. 60, pl. 17, fig. 2.

B. 6; D. 14-16; A. 4-16; V. 1-5; C. 3, 1, 7, 7, 1, 3; P. 16.

This singular Chaetodon is oblong-oval. Scales on the sides of the body rather large. The head comprises nearly a fourth of the total length; its upper line of profile slightly convex, rising at an angle of about 45°. Eyes large, sub-circular, their greatest diameter entering three times in the length of the head and once in advance of their own orbit. Preoperculum finely dentated. The lateral line forms a gentle arch, more regular than usual in the genus. The spiny portion of the dorsal is regularly arched, three times as long as its soft portion, which latter is deep and acutely pointed in its anterior half; its hinder margin is nearly vertical owing to the rapidity which the rays diminish in length. Anal long, with four anterior spiny rays, not so deep as the soft part of the dorsal; strongly arched along its margin. The

Caudal is slightly convex along its hinder margin, and the angles are slightly produced

Color bluish-white, deeper tinted above, inclining to deep gray. Sides of the body with numerous bluish-lead lines, forming obtuse angles; the angles confined to the median line of the fish. A yellow line on the base of the pectoral. Ocular band black, paler beneath the eyes, nearly as wide as the orbits, margined with white and yellow and traversing the whole depth of the head. Two oblong pale spots on the lateral line. Dorsal and anal orange, their soft portions narrowly edged with black. Caudal black, with a posterior intramarginal orange stripe behind which the fin is edged whitish, the two colors separated by a narrow black line. Ventrals creamy-white Pectorals colorless.

Length, 4½ inches.

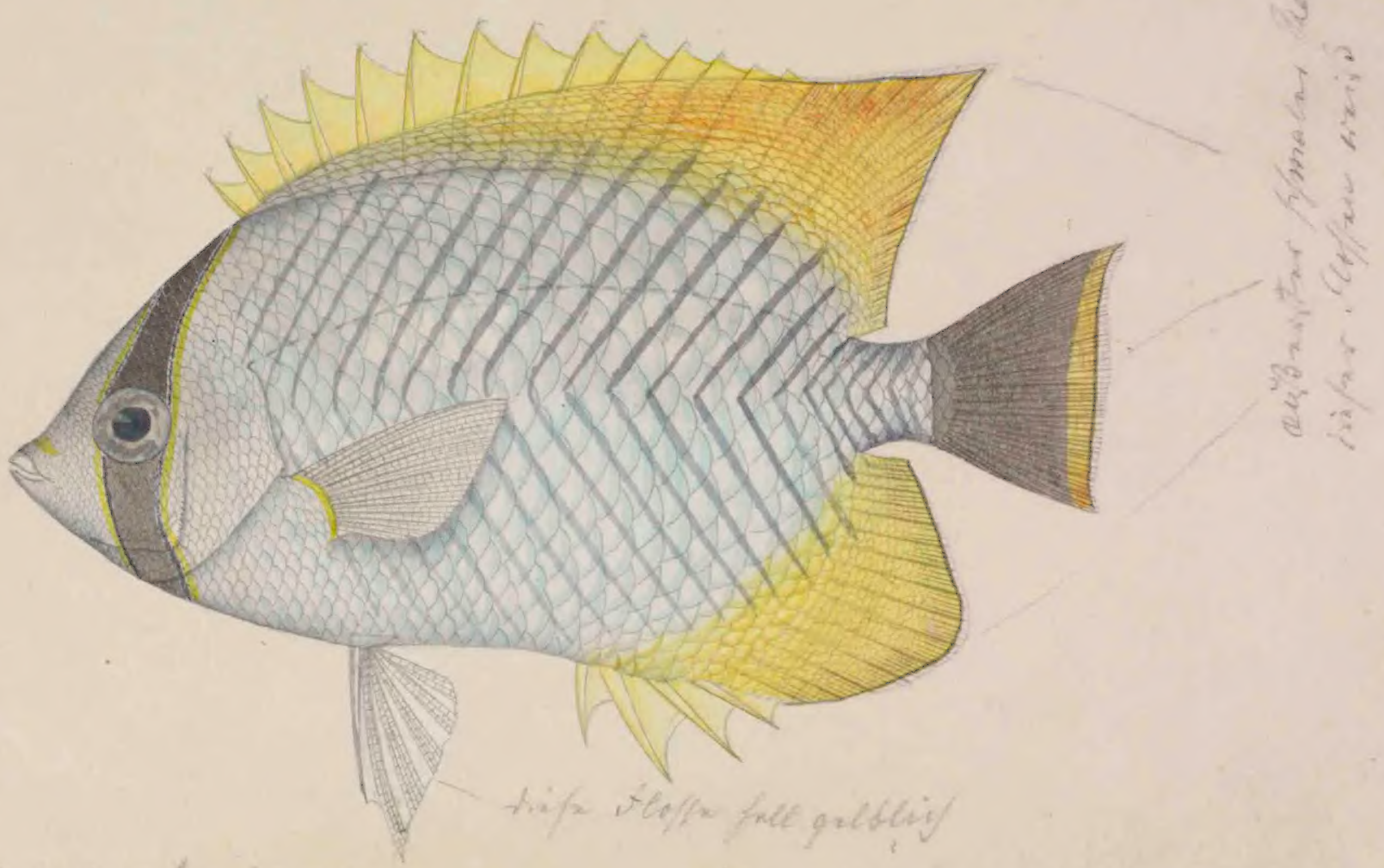
Habitat. Society Isls.

Remarks.—This species will no doubt form the type of a new genus, characterized from the true Chaetodons by its more oblong form and four anal spiny rays. The figure in the Zoology of the "Blossom" is wretched. Solender's specimens also came from Tahiti.

Chaetodon strigangulus

t. 96. fig. A

59



Chaetodon strigangulus

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Chaetodon setifer

Chaetodon setifer, Bloch.

Chaetodon setifer, Bloch, pl. 425, fig. 1.
" " Cuv. et Val., Hist. Nat. des Poiss., vol. 7, p. 76.
" " Lesson, Zool. Voy. Coquille, p. 175, pl. 29, fig. 2.
" " Richardson, Rep. Brit. Ass., 1846, p. 246.

D. 13-23; A. 3-21; V. 1-5; P. 15; C. 2, 1, 8, 7, 1, 1.

This Chaetodon belongs to that division of the genus, characterized by having the first soft rays of the dorsal fin drawn into a filament. The muzzle is long and sub-conical in shape. The upper line of the head is very steep, rising from the muzzle at an angle of about 60°. The eyes are large, oval in shape, their greatest diameter one-fourth the length of the head. The scales on the middle of the flanks are very large. The posterior portion of the dorsal fin is vertical, and arched in outline, the margin reaching far behind the base of the caudal. The posterior half of the anal which presents a sharp angle, extends more posteriorly than the arched dorsal. When expanded, the hinder margin of the

caudal is convex.
Color grayish-white. The upper posterior portion of the body is yellowish-brown, angulated anteriorly, and traversed by two or three right-angled yellow stripes. The superior anterior part of the body is lineated, obliquely upward and backward with black lines, which slightly radiate from the gill margin, and increase in width as they ascend. The remainder of the body is lineated downward and backward by similar lines, which run into the posterior one above, forming right angles. The ocular band is black, arched over the forehead, becoming broad and diffuse beneath the eyes. The interocular space is transversly lineated with orange. Irides blackish. The spiny portion of the dorsal is yellow; its soft part orange, margined behind the filament with black, and a large oblong ovalish black spot marks the upper middle portion of the fin. The caudal trunk, and the basal half of the fin is orange, the outer part colorless, the two portions divided by a yellow, black edged vertical bar. The ground color of the body encroaches considerably on the orange anal, which is

also orange, margined as far as the angle with yellow; the two colors separated by a fine black and white line. Pectorals and ventrals colorless.

Length, 7 inches.

Habitat. Sandwich Isls, Kingsmill Isls, Caroline Isls, Hervey Isls, Society Isls, Paumotu Isls, China, East Indies, Mozambique.

Remarks. This fine species has a very wide range if found at all the above mentioned localities, some of which I give on the authority of other writers ~~on~~ by on the Pacific fishes. The specimen figured by Lesson, in the Zoology of the Voyage of the "Coquille" was obtained at Tahiti. It is both badly colored and faulty in outline. The body is too short, the snout too high up, caudal too large as are also the scales along the nape and back. The dorsal fin shows but 9 spines, though his text gives 13. It dose not extend far enough forward, and its filament is too far posterior and too large.

Unterschrift wie zuvor

Unterschrift für Tafel 26

A. Chætodon strigangulus. B. Chætodon setifer.

t. 26. fig. B

Chaetōdon setifer

(no fig.)

Chaetodon ephippium

Chaetodon ephippium, Cuvier.

Chaetodon ephippium, Cuv et Val., Hist. Nat. des Poiss., Vol. 7, p. 80, pl. 174

Chaetodon Garnotii, Lesson, M. S.
Chaetodon ephippium, Less., Zool. Voy. Coquille, p. 174, pl. 29, fig. 1.

D. 13–26; A. 3–23; V. 1–5; P. 15; C. 3, 1, 8, 7, 1, 2.

The general outline is oval. Scales rather large on the middle of the flanks. The head, which constitutes one-fourth of the total length, is very precipitate, rising from the snout at an angle of 60°. The eyes are large, their diameter entering four times in the length of the head, and their insertion is a triple nearer to the hinder termination of the opercle than the end of the snout. The muzzle is produced, rather pointed and conical in shape. The anterior articulated rays of the dorsal fin are drawn out in a long filament, posterior of which the fin is precipitately arched. The anal which extends more posteriorly than the fin above, is slightly angulated on its hinder third. When the caudal is

expanded its posterior margin is nearly straight.

Body greenish-yellow. Breast, and lower half of the head, rich orange. Upper half of the head, pale violaceous. The dusky ocular band is small and obscure. Irides golden yellow. The lower half of the body is ornamented with several, rather close, longitudinal, light violaceous-steel stripes, and faint indications of two or three others on the shoulder, which are vertical. A very large oval black area covers the upper posterior part of the body and soft dorsal fin. The lower part of the black space, and soft dorsal fin, are broadly margined with white. The upper posterior portion of the black area contains an elongate yellow spot, shaded off with orange-red. Spiny dorsal light yellowish. The caudal peduncle is white anteriorly and orange-red be-hind. Caudal fin nearly colorless, edged above and beneath with orange-red. The anal fin is white along its basal half, then follows a narrow lemon colored stripe, this by an orange-red one, the succeeding one white and the fin broadly margined with yel

-low. Ventrals and a basal stripe in the pectoral, orange.

Length, 7 to 8 inches

Habitat. Society Isls, Kingsmill Isls, Hervey Isls, Paumotu Isls.

Remarks.—The large black patch will readily distinguish this singular marked species. M. Lesson's figure in the zoology of the Voyage of the "Coquille" is not very correct. The ribbon-like stripes on the fins differ some in different individuals. Our drawing was made from an adult specimen caught at the Society Isls, where it is called "Pa-ra-ra-e-ia."

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plate missing

Chaetodon semicon

Chaetodon ~~punctatus, Garrett~~

B.6; D.14-25; A.3-23; V.1-5; P.15; C.2,1,7,7,1,2.

The general aspect of this magnificent Chaetodon is oval. The scales on the flanks large. The head, which forms nearly the fourth of the fish, is very precipitate, rising at an angle of 60°. The snout is produced and sub-conical. The eyes are large, oval, nearly one-fourth as long as the head, and inserted about midway be-tween the end of the snout and the hinder corner of the opercle.

The dorsal and anal fins are rather low, and there is no dep-ression at the union of the spiny and soft portion of the former. The anterior rays of the soft part of the dorsal are drawn out into a long filament, and the fin is posteriorly sub-angulated, which corresponds to a similar one on the margin of the anal fin. The caudal is very deep-ly emarginated so that the fin is sub-bifurcated.

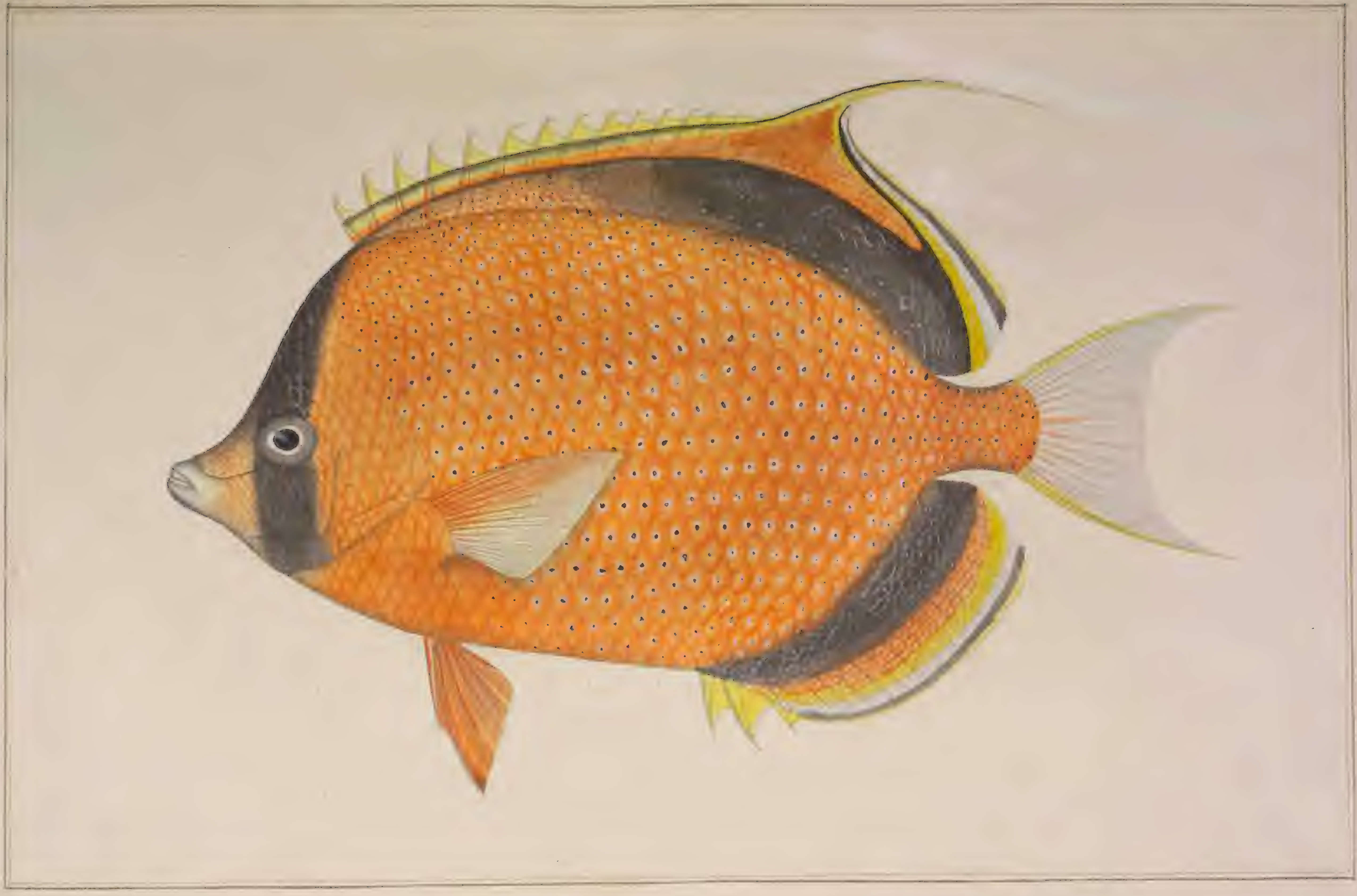
Color rich orange red. Each scale with a black or blue-black dot

shaded off with hazy white. Ventral band black, broad and traversing the whole depth of the base. A broad black band, under the basal half of the anal fin; then succeeds a narrower orange red one, out-side of which there is a yellow, white and black ribbon, the latter with a yellow border. The lower two-third of the posterior half of the dorsal is black, from which a black line comes up to the filament. The upper portion of the soft dorsal is lineated with a yellow, white, black and yellow ribbon, disposed in the order mentioned. The upper part of the spiny portion of the fin is yellow, through which runs a black line which terminates in the filament. Ventrals and pectorals orange red. Caudal nearly colorless, tinged with yellow above and the rays are edged with red.

<u>Length</u>, 5 to 7 inches.

Habitat—Society Isls.

<u>Remarks</u>— At the above location I obtained several specimens of this fine species. The peculiar ground color and dots are the most striking characters, and will at once determine the species. It belongs to the same group as <u>C. setifer</u> and <u>C. ephippium</u>, characterized by the dorsal filament.



62

Chaetodon semeion

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Chaetodon unimaculatus

Chaetodon unimaculatus, Bloch.

Chaetodon unimaculatus, Bloch, vol. 3,
p. 75, pl. 201, fig. 1.
" " Gmelin, p. 1258.

D. 13-23; A. 3-20; V. 1-5; P. 14; C. 2, 1, 6, 6, 1, 1.

Form roundish-oval. Scales small. The head comprises about a fourth of the total length. Its upper profile rising at an angle of about 55 to 60°. Eyes large, circular, their diameter entering three times in the length of the head. The dorsal fin presents a uniform arch, slightly depressed along the middle, of which its soft portion forms ~~a~~ nearly a quarter of a circle. The margin of the anal is convex and nearly vertical. The caudal is even or slightly concave posterior.

Color white. A large round black spot marks the upper middle portion of the body, which, in some specimens is slightly diffused downwards. Several yellow lines descend obliquely forward from the dorsal fin, fronting the large spot, each forming an obtuse angle above the pectorals and disappearing behind that

fin. The ocular band is black, nearly as wide as the eyes, and extending the whole depth of the head. Sides silvery, varied with dusky. Pectorals and caudal colorless. The ventrals, dorsal and anal yellow, the two latter posteriorly margined with black, which color is continued across the caudal trunk. A white line separates the black margins from the yellow ground of the fins.

Length, 5 inches.

Habitat.— Sandwich Isls, Society Isls, Kingsmill Isls, Paumotu Isls. East Indies.

Remark.— The simple black spot on a white ground will distinguish this species from C. vinctus; the latter fish is yellow, and has the spot margined with bluish.

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Chaetodon unimaculatus

Chaetodon bennettii.

Chaetodon vinctus, Lay et Bennett

Chaetodon vinctus, Lay et Bennett, Voy. Blossom, Zool. Fishes, p. 62. pl. 17. fig. 1.

B.6; D.14-15; A.3-17; V.1-5; P.16; C.2,1,7,7,1,3.

The general outline of this species is oval. The head comprising not quite a fourth of the entire length, and rises from the snout to the dorsal fin at an angle of about 55°. The eyes are oval in shape, their point of insertion being mid-way between the end of the snout and the hinder opercular angle, and their greatest diameter is nearly one-third of the length of the head. Under the lens, may be seen fine denticulations along the margin of the preopercle. Scales large. The soft portion of the dorsal and anal fins are posteriorly rounded off. The caudal when expanded presents a posterior convex margin.

Color rich yellow when alive, and when dead changing to a paler yellow. A large round black spot, margined with blue or bluish-white, marks the upper middle portion of the body. Two blue or bluish-white

narrow stripes commence at the base of the head, one passing above, the other beneath the base of the pectorals, and both terminate on the base of the anal fin. The ocular fascia is brownish-yellow, becoming deep brown towards its margins, which are edged with bluish-white; it extends the whole depth of the head and passes over the nape. The pectorals and the hinder third of the caudal, colorless. Ventrals orange. Brownish obsolete stripes may be observed along the base of the soft dorsal and anal, and continuous similar submarginal ones are present.

Length. 5 to 6 inches.

Habitat.—Society Isls, Kingsmill Isls. Paumotu Isls.

Remarks.—I have obtained specimens of this beautiful species at all the above locations, though it is not abundant. The figure in the Zool. of the "Blossom" is very poor.

64

Chaetodon bennettii

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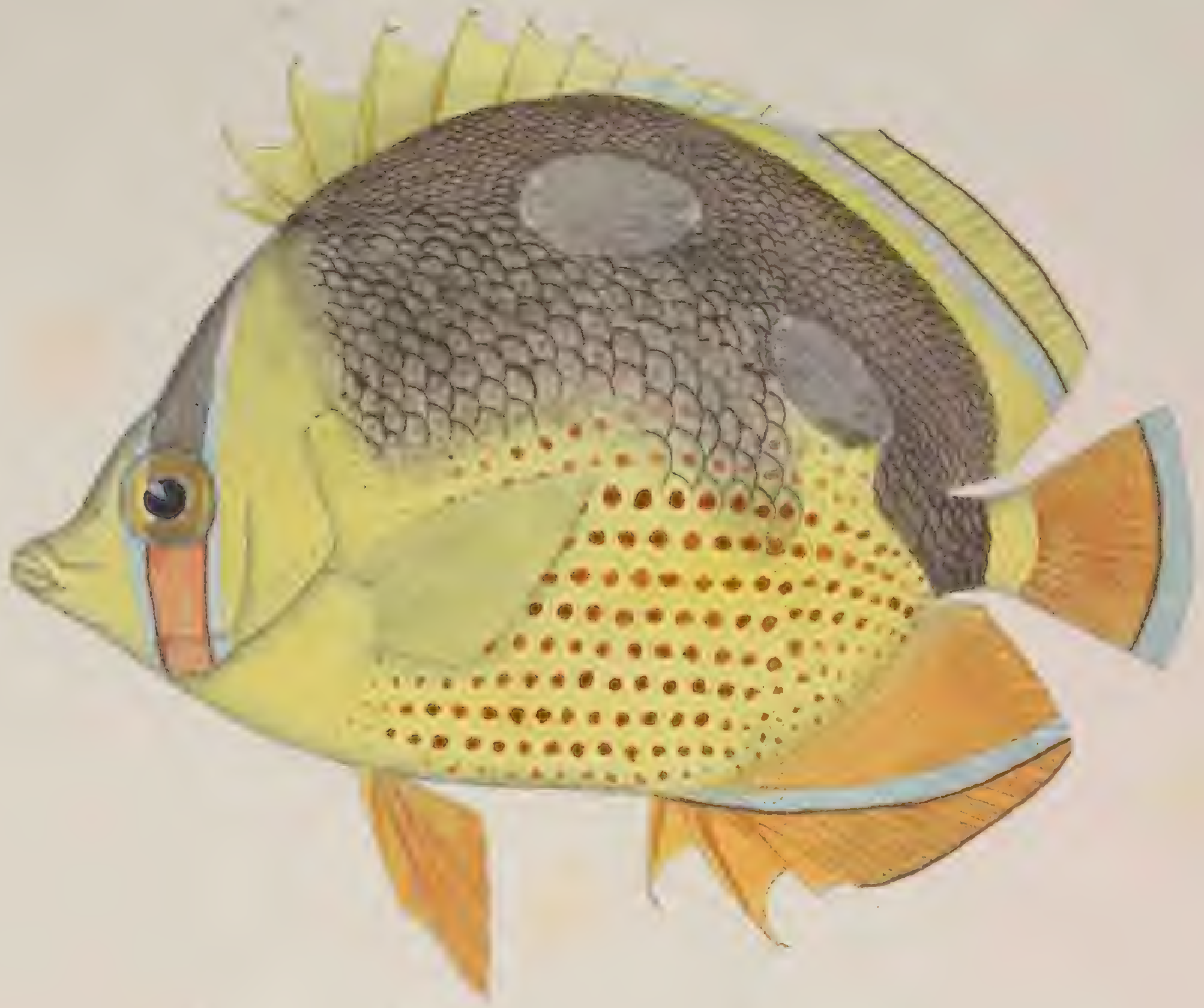
Unterschrift für Tafel 30

A. Chætodon quadrimaculatus; B: Chætodon ornatissimus.

NB. In beiden Figuren ist die Zeichnung des Bleistift für die Druckentafeln des Originals zu substituiren

424



65 (70 M.S.S.)

Chaetodon quadrimaculatus

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22 Chaetodon ornatissimus

Chaetodon ornatissimus, Solander.

Chaetodon ornatissimus, Solander, MSS.
" " Cuvier & Val., Hist. Nat. des Poiss., vol. 7, p. 22.
" " Lesson, Zool. Voy. Coquille, vol. 2, p. [illegible], pl. 26, fig. 1.

D. 12-26; A. 3-22; V. 1-5; P. 17; C. 4, 1, 7, 6, 1, 3.

Form oval. Scales small. The head is nearly a fourth of the total length; its upper profile very precipitate, rising at an angle of about 60°. Eyes large, circular, their diameter two sevenths the length of the head. The dorsal fin presents a nearly uniform curve, with a very slight depression along its middle. Its soft portion, together with the anal is angulated in their posterior third, the angles reaching far beyond the base of the caudal. The latter fin is rounded on its hinder margin.

Color: the sides of the body, soft portions of the dorsal, anal, and the basal half of the caudal whitish-gray. The breast, belly, head, ventrals, and the spinous portion of the dorsal and anal bright yellow. The sides of the

body are ornamented with six, oblique, broad, dusky margined orange stripes, which are directed upward and backward. Some of the bands terminating in the soft portion of the dorsal fin, one on the trunk of the caudal fin and the lower one traverses the basal portion of the anal fin. Three similar colored narrow, abbreviated stripes in advance and parallel to the base of the pectoral fin. Interocular space brownish-black. Lower lip, a band encircling the muzzle, the narrow ocular band, black. The latter band passes over the forehead and under the throat. Two vertical black lines on the opercular pieces, the posterior one short, the other passing over the nape, and along the entire length of the dorsal fin just beneath its margin. The stripes on the head are more or less margined with whitish. Irides light yellow. Pectorals colorless. The soft dorsal and anal are margined with yellow, the former edged with black, and the latter with a wide intramarginal deep brown band. A vertical deep brown band marks the middle of the caudal, posterior of which the fin is yellowish, and near the hinder margin is a pale brown line.

<u>Length</u>, 8 to 10 inches.

<u>Habitat</u>.—Sandwich Isls, Society Isls, Kingsmill Isls, Hervey Isls, Caroline Isls, Paumotu Isls.

<u>Remarks</u>.—I have collected specimens of this highly ornamented species at all the above mentioned locations. Lesson gives an excellent figure of it in the Zoological part of the Voyage of the "Coquille". The six orange oblique stripes will at once distinguish it from any of the numerous species inhabiting the Central Pacific.

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Chaetodon ornatissimus

Chaetodon ornatissimus

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Chaetodon Tremblii

Chaetodon Tremblii, E. T. Bennett.

Chaetodon Tremblii, E. T. Bennett, Zool. Journ. vol. 4, p. 42.

D. 13-22; A. 3-17; V. 1-5; P. 16; C. 4, 1, 8, 7, 1, 3.

The general aspect of this species as seen in profile is oblong-oval. Scales rather large. The head falls a little short of a fourth of the total length. Its upper line rising from the pre-medial angle at an angle of about 50°. Eyes large, situated midway between the end of the snout and the hinder angle of the operculum. The outline of the dorsal fin is rounded above, and its soft portion which is shorter than usual, presents a posterior vertical margin which does not reach so far back as the caudal base. The anal fin is rather small and similar in outline to the soft part of the fin above, both, owing to their vertical margins give the fish a truncated appearance. Caudal posteriorly concave.

The general ground color is dusky yellow, and bluish-white beneath. The sides with ten or eleven longitudinal, slightly ascending blue, dark margined narrow stripes, several of which are continued

over the head where they become more or less broken and irregularly disposed. A blue-black spot marks the front of the dorsal fin. Sides pale straw-yellow. The posterior lower half of the soft dorsal, the anterior half of the caudal trunk, and a small portion of the anal fin, covered by a large black patch, rounded anteriorly where it is margined with blue, which color is continued along the margins of the two fins. Pectorals nearly colorless. The posterior half of the caudal trunk is white, and the basal portion of the fin is blackish, the middle with a transverse lunuliform deep black bar, posterior of which the fin is grayish. All the other fins are yellow.

Length, 6 inches.

Habitat — Sandwich Isls.

Remarks. — This Chaetodon presents the unusual character of wanting the ocular band.

67

Chaetodon fremblii

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[Chaetodon falcula (the [illegible] [illegible] multilineatus)]

Chaetodon ~~multilineatus, [illegible]~~

D. 12-25; A. 3-20; V. 1-5; P. 15; C. 3,1,8,7,1,2.

The general shape of this Chaetodon is roundish-oval, and the scales on the body are large. The head, which terminates in a prominent pyramidal snout, is a little more than one-third of the total length of the fish. The eyes are large, sub-circular in shape, their diameter one-fourth the length of the head, and situated nearer to the opercular corner than the end of the snout. The preopercular bone is minutely denticulated. The upper profile of the head rises from the muzzle at an angle of about 60°. The dorsal fin exhibits a slight depression at the union of its two portions, and its soft part, together with the anal have their hinder halves strongly angulated; the angles reaching posterior to the base of the caudal, which latter fin is convex when expanded. That portion of both dorsal and anal in advance of their angles are gently arched in their outlines.

Color of the living fish, white, abruptly becoming rich orange near the posterior portion of the body, which

latter color extends over the soft part of the dorsal, and a large portion of the caudal and anal fins. Two large, wide black bars on the upper half of the body, the posterior one the darker, and both uniting on the dorsal fin. Sides with numerous black lineations which descend obliquely downward and forward. A black spot on the caudal trunk. The ocular band black, curving over the forehead and fading away beneath the throat. The interocular space is lineated with orange. The spiny portion of the dorsal is tinged with lemon-yellow, and the soft part which is margined with brown is marked by a dotted orange-red line. A similar line on the anal base, and the middle of the fin is traversed by a wide orange-red band which is separated from the broad light yellow margin, by a fine black and white line. The wide colorless posterior margin of the caudal is traversed by a brown streak. Ventrals white. Pectorals colorless.

Length, 6 inches.

Habitat.—Kingsmill Isls, Hervey Isls, Society Isls, Paumotu Isls.

Remarks.—The oblique lines and two wide black bars will readily determine this fine species.

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Chaetodon falcula

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Chaetodon collaris

Chaetodon superbus, Brouss.

Chaetodon superbus, Brouss.

Chaetodon reticulatus, Cuv. et Val., Hist. Nat. des Poiss., Vol. 7, p. 32.

" " Lesson, Zool. Voy. Coquille, Vol. 2, p. 178, pl. 30, fig. 2.

D. 12–25; A. 3–23; V. 1–5; P. 15; C. ?.

Form oval. Scales moderate. The head, which is about one-fourth of the entire length is obtuse in front, the snout being but little produced. The upper line of profile rises at an angle of about 50°, and presents a slight concave depression in the occipital region. The large eyes are circular, their diameter being two-seventh the length of the head.

The dorsal and anal fins are deep, the former presenting a uniform curve, and angulated in the posterior third of its soft portion, which angle extends beyond the middle of the caudal fin. The anal fin does not extend so far back as the fin above, and the angle is more obtuse. Caudal convex behind.

Color black, gradually becoming paler above, and abruptly grayish anteriorly. Breast lemon yellow. Each scale in the lower half of the body contains a lemon yellow spot, and those in the upper parts grayish ones. The wide deep black ocular band, which is margined with yellow, passes over the forehead and down along the throat. Snout blackish brown. Interocular space gray, with yellow margins. Irides yellow, shaded with brown. Pectorals colorless. Ventrals, anal and basal third of the caudal black, the latter being gray on the middle third, posterior of which are two transverse black stripes enclosing a yellow one, and edged behind with a colorless margin. The anal has an intra-marginal and marginal lemon yellow stripe. The soft part of the dorsal is shaded off with lemon yellow, and penciled with a fine black line. An oblong light red spot marks the posterior edge of the anal fin.

Length, 6 inches.

Habitat.— Society Isl. Paumotu Isl.

Remarks.— M. Lesson's colored figure of this species, in the Voy. Coquille, Zool. is scarcely recognizable.

Unterschrift für Tafel 31

A. Chaetodon collaris. B. Chaetodon pelewensis

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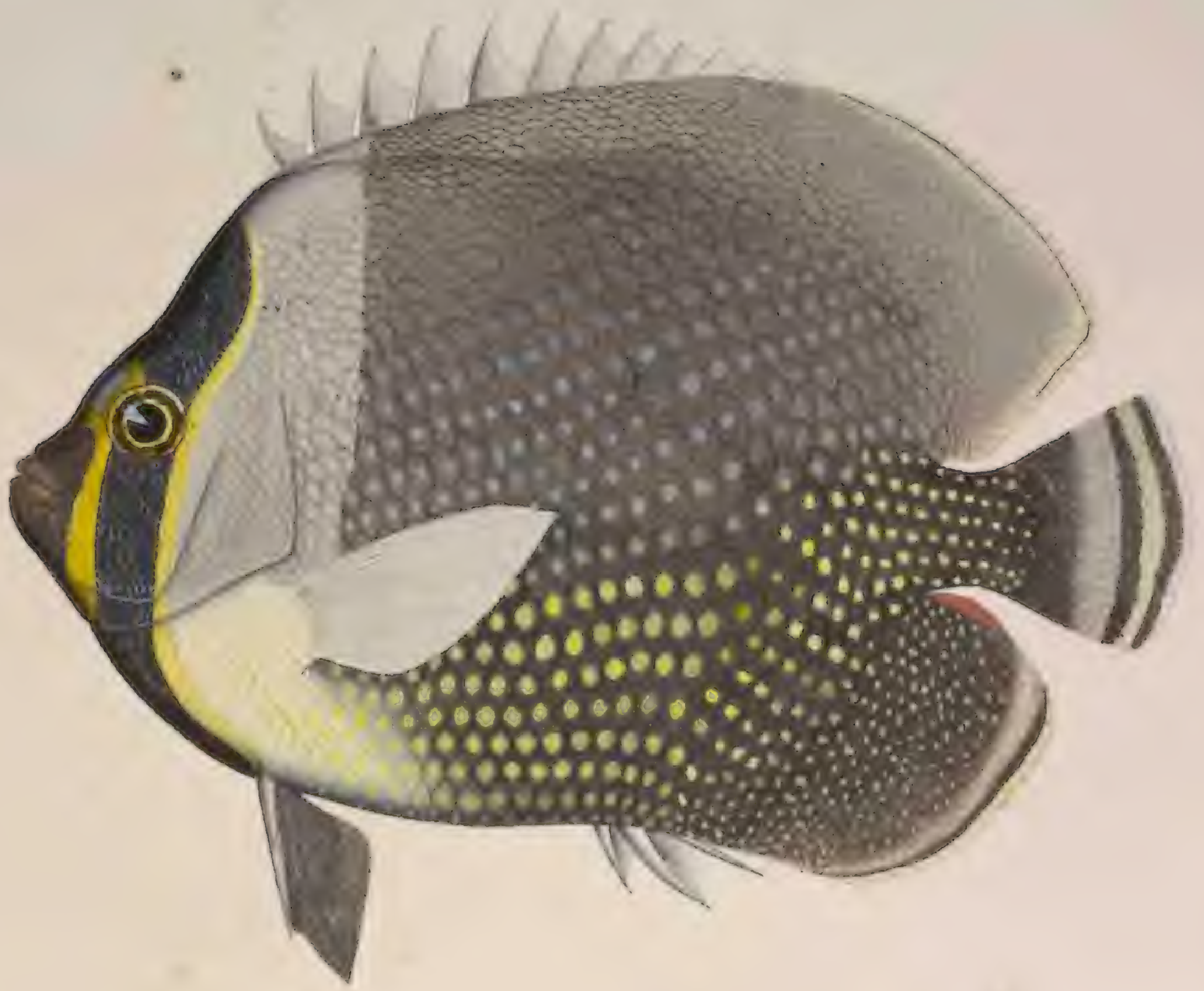
der Lithograph hat die Verbesserungen der dorsal Stacheln u. Schwanzflosse von Figur B zu beachten

69

158



69

Chaetodon collaris

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Chaetodon trifasciatus

Chaetodon tricolor, Garrett

D. 12–23; A. 3–15; V. 1–5; P. 13; C. 3, 1, 8, 7, 1, 2.

This Chaetodon is of an oval shape, and the upper line of the head is very precipitate rising at an angle of about 55°. The head as compared to the entire length is about one to four. The large eye is oval and enters ~~four~~ 3½ times in the length of the head.

The dorsal fin is rounded posteriorly and the anal is arched along its lower margin. The caudal is slightly emarginate.

Color of the anterior half of the fish white, the posterior plate yellow, the two colors separated by a large oblong vertical black diffused patch. A black band passes from the forehead, cutting the eye and curves down on the breast. Irides dusky. Ventrals black. The soft dorsal and anal edged with black. Caudal with a narrow posterior white margin.

Length 5 inches.

Hab.—Society Isls.

Chaetōdon trichrous

70

148

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Chaetodon vittatus

Chaetodon trifasciatus, Mungo Park.

Chaetodon trifasciatus, Mungo Park, Trans. Lin. Soc. Vol. 3, p. 34, 1797.
= vittatus, Schneider, Bloch; Syst. Ichth. p. 227. 1801
= bellus, Sol. MS.
= macrolepidotus; carneus, &c. Lesu, Mus. Vol. 3, p. 101, Pl. 29, fig. 18.
= vittatus, Lay et Bennett, Voy. Blossom, Zool. p. 61, Pl. 17, fig. 3.

D. 13–21; A. 3–20; P. 14; V. 1–5; C. 1, 5, 7, 1 and several rudimentary rays.

The form of this species is oval, and the head as compared to the entire length of the fish is as one to four and a half. The scales are of medium size on the flanks. The profile of the head above is nearly straight, with a very slight depression above the eyes, and the descent is not as precipitate as in most of the species. The large eye comprises about a third the length of the head. The rounded pre-opercular corner exhibits faint indication of spinlets.

The dorsal fin commences a trifle posterior to the opercular angle, the soft portion is much the shortest on its base, and is acutely angular posteriorly. The anal fin extends over a base equal to one third the total length of the fish, and is similar in outline to the fin above.

The ground color cupreous yellow, darker above and light yellow beneath. The side is ornamented with 14 or 15 longitudinal slightly curved purplish-brown stripes, which are not quite as wide

as their interspaces. A reddish spot marks the anus. Head pale yellow, the operculum the same hue as the body; a black vertical band encircles the head, cutting through the eye, the face the same color, with a deep brown chin, and there is a faintly defined blackish stripe parallel and posterior to the one cutting the eye. All the band are more or less white along their margins. Irides yellow with dusky shades. A saffron colored spot in front of the dorsal fin. Ventrals light yellow, and the pectorals colorless. The caudal and tail whitish, the latter with an irregular transverse basal black bar which is margined with ~~white~~ yellow. The spinous dorsal is is pale yellow, with a whitish scaley base and the soft portion of the fin is broadly margined with orange, a narrow blackish edging below, then a wide white band which gradually becomes yellow in the basal half of the fin, which is also traversed by a black band which tapers away anteriorly. The anal fin is whitish along the base, then lemon yellow, the latter color being traversed by a longitudinal deep black band, which is somewhat contracted in the middle and becoming enlarged and rounded behind. The outer half of the fin is dull reddish, which color is margined with dusky all round and the extreme edge is pale yellow. The spinous portion is orange.

Length 6 to 7 inches.

Hab.—Paumotu, Society and Samoa Isls.

Chaetodon vittatus

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Chaetodon lunula

Chaetodon lunulatus, Quoy et Gaim.

Chaetodon lunulatus, Quoy et Gaim., Voy. Freycin. Zool., p. 381.
" " Cuv. et Val., Hist. Nat. des Poiss., Vol. 7.

D. 12-24; A. 3-19; V. 1-5; P. 17; C. 2, 15, 7, 1, 2.

This beautiful Chaetodon is of an oval shape and the scales on the flanks are large. The head as compared to the total length is as two to seven. The snout is prominent and pyramid-ical in form. The upper line of profile is precipitate, rising at an angle of about 70°, and there is a slight depression above the interorbital space. The preopercular margin is slightly dentated. The eyes are large, sub-circular and placed just midway between the end of the snout and the hinder opercle angle.

The soft portion of the dorsal fin is angulated in its posterior third, which extends back far beyond the base of the caudal. The general outline of the anal is similar to the fin above. Caudal convex.

The general color is rich yellow, passing into blackish above,

and deep black on the upper anterior portion of the body. The sides marked with ten or eleven vermillion-red stripes, which are directed obliquely upward and backward. Several similar colored spots may be observed on the side of the breast. A diffuse vertical orange stripe marks the posterior boundary of the above mentioned deep black area. A similar forked stripe above the shoulder, one branch passing over the nape. Ocular band deep black, equalling the diameter of the eye in width, filling the interorbital space, and extending down as far as the lower preopercle margin. A broad white band extends over the base of the head. Sides varied with yellow and black. The spinous portion of the dorsal is clouded with dusky on a lemon-yellow ground. The soft dorsal and anal broadly margined with deep brown, and a wide vermillion-red band traverses their middle portion, both tapering away anteriorly. A tapering black band, shaded off with orange anteriorly, starts from the base of the caudle peduncle and follows the base of the soft portion of the dorsal fin. The caudal is

marked with transvers stripes like those in the anal fin, and its posterior margin is colorless. The ground color of all the fins are yellow.

Length, 6 inches.

Habitat. Sandwich Isls, Hervey Isls, Kingsmill Isls, Society Isls, Paumotu Isls.

Remarks.— The native name at the Sandwich Isls, is "Ki-ka-kapu". At the Society Isls it is called "Pa-ra-ra"

72

Chaetodon lunula

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Chaetodon lunula jur.

Chaetodon biocellatus, Cuv.

Chaetodon biocellatus, Cuv. et Val., Hist. Nat. des Poiss. Vol. 7, p. 62

" " Lesson, Zool. Voy. Coquille, Vol. 2, p. 176

D. 12-25; A. 3-19; V. 1-5; P. 16; C. 2, 1, 8, 7, 1, 1.

Form oval. Scales rather large on the middle of the sides. The general shape of the head and fins are nearly similar to C. lunulatus. The color and markings are also very much like that species. The ground color is lemon yellow on the lower half of the body, and blackish above. The former color with oblique reddish lines as in C. lunulatus. Two elongate, and one round yellow spot above the pectoral fin. The posterior portion of the head white. Dorsal and anal margined with black, and a similar colored large spot in the anterior half of the soft dorsal. The outer portions of the soft dorsal, anal and the outer half of the caudal whitish, the latter fin with a median transverse black stripe.

Length 4 in.

Habitat. Sandwich Isls. Kingsmill Isls.

73

Chaetodon lunula

157

0 1 2 3 4 5 6 7 8 9 10 cm copyright reserved
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41 Chaetodon vagabundus
([illegible])

Chaetodon ~~geometricus, Garrett~~

D. 13-25; A. 3-23; V. 1-5; P. 15; C. 5, 1, 7, 7, 1, 2.

Form oval. Scales on the sides of the body large. The head is one-fourth of the total length, and the muzzle is somewhat prominent, being abbreviated, sub-conical in shape. The upper line of profile rises at an angle of about 50°. Eyes oval, their greatest diameter two-sixth the length of the head, and situated just midway between the end of the snout and the hinder corner of the opercle. A slight depression along the middle of the dorsal fin, which together with the anal are posteriorly angulated; the angles extending back as far as the middle of the caudal fin. The expanded caudal is convex posteriorly.

The ground color is greyish white. Seven or eight blackish lines ascend upward and backward in a radiating manner from the upper gill openings. The posterior half of the body is similarly lineated, the lines parallel and descending downward and backward, all anastomosing with the nearest one that runs at right angles. The black ocular fascia completely

encircles the head and covers the fore-head and nape. The interocular space is transversely lineated with orange-yellow. A large curved black fascia bounds the upper and posterior portion of the body. The spinous portion of the dorsal steel-blue; its soft portion, the caudal trunk and fins, together with the anal, rich yellow. The soft dorsal with a wide black upper margin, the anal with a still broader one of a lemon yellow which is divided in two by a narrow black line. A vertical black stripe crosses the basal half of the caudal and a deep brown one edged with white, marks the outer portion. Ventral white. ~~[illegible]~~ Pectorals colorless.

Length, 5 to 6 inches.

Habitat — Kingsmill Isls. Society Isls. Paumotu Isls.

Remarks — The arrangement of the lineations of this species is the same as in C. setifer, but differs in every other respect.

Chaetodon vagabundus

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Chaetodon pelewensis

Chaetodon ~~fasciatus, [illegible]~~

D. 13-24; A. 3-19; V. 1-5; P. 15; L. 2, 1, 2, 1, 1.2.

Form oval. Scales large. The head comprises a fourth of the total length. Snout obtusely sub-conical. Facial line precipitately convex, rising at an angle of about 50°. Interorbital space prominent. Eyes circular, a little nearer to the end of the snout than to the end of the opercle. Preopercle minutely denticulated.

A slight depression along the middle of the dorsal margin, and its soft portion angulated on the posterior half. The margin of the anal fin rounded. The expanded caudal presents a posterior convex margin.

Color: Sides of the body yellow, gradually passing into greyish on the head, breast, belly and fins. The yellow ground is ornamented with six, oblique, slightly curved, equidistant, tapering purple bands, all terminating on the soft dorsal base, and separating anteriorly into spots. Ocular band minute, yellow, with dark margins, and beneath the eye shaded off with violet. A small triangular orange spot in front of the

dorsal which is shaded off with black. The caudal trunk is orange or yellow, their line of union oblique, and the former color tinging a small portion of the dorsal and anal fins. Pectorals colorless. Ventrals white. The caudal is marked with a basal, gibbous, black bar, posterior of which the fin is colorless. The lower part of the spinous portion of the dorsal is orange, nearly colorless above, and a black line margins the former color, and continued along the soft portion of the fin as far as the marginal angle. The soft portion of the fin is edged with yellow as far as the angle. The anal is margined with pale yellow, which gradually becomes white towards a wide intra-marginal black stripe which runs parallel with the arched outline of the fin.

Length, 5 inches.

Habitat. Society Isls, Paumotu Isls.

Remarks. The drawing and description are from a single young specimen obtained at the former location. At the Paumotu Islands I saw several adults swimming about the coral reefs.

150

Chaetodon pelewensis

75

2. Chaetodon multicinctus, Garrett.

Chaetodon multicinctus, Garrett; Proc. Cal. Acad. Nat. Sci., Vol. 3, p. 105. 1863.

D. 15-24; A. 3-19; V. 1-5; P. 15; C. 2, 1, 8, 7, 1, 2.

The general outline of this species is oval. The head comprising about two-ninth of the total length of the fish. The upper line of profile from the snout to the origin of the dorsal fin, is but slightly curved, and rises at an angle of about 60°. The snout is abbreviated. The eyes are large, circular in shape, situated midway between the tip of the snout and the hinder termination of the operculum; their diameter as compared to the length of the head is as one to three. The margin of the preoperculum exhibits a few minute denticulations. Scales of moderate size.

Both dorsal and anal fins are posteriorly rounded off. Caudal truncate. The ventrals are pointed.

Color creamy-yellow. The sides of the body is marked with five, vertical, yellowish brown stripes; the two anterior terminating on the belly, the others at the base of the anal fin. There is

a slight indication of a sixth stripe along the basal half of the dorsal fin. Each scale is marked with a faint yellowish-brown dot. A yellow line starts from a point above the ventrals, following the belly and uniting to a black one which traverses the anal fin. A blue-black spot marks the origin of the dorsal fin. The ocular fascia is brown, not very wide, and extends from the spot in front of the dorsal fin down to the lower margin of the preopercle, where it changes to yellow. A vertical black stripe anteriorly shaded off with vermilion, marks the middle of the caudal trunk. Sides chrome yellow. The dorsal spines and filaments are orange-yellow, and the interradial membrane is colorless. The middle third of the soft dorsal and anal, ochre yellow, the former with a wide yellow, and the latter with a light green margin, the colors separated by black & white thread-like lines. Caudal and pectorals colorless, the former with a basal, black luniform vertical bar. Ventrals whitish.

<u>Length</u>, 3 to 4 inches.

<u>Habitat.</u> Sandwich Isls.

<u>Remarks.</u> I obtained two specimens of this rare species at the above location, both of which are in the Collection of the California Acad. Nat. Science.

156

Chaetodon multicinctus

156

76

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cm
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Chaetodon rafflesii

Chaetodon No 48

D. 13–24; A. 3–22; V. 1–5; P. 13; C. 3, 1, 8, 7, 1, 2.

The general outline of this Chaetodon is roundish ovate, and the head, which is produced into a short rapidly tapering snout, comprises a third of the total length, the caudal fin excluded in the measurement. The scales on the flanks of the body are rather large. The eyes are quite large, circular in shape, and their diameter equals a trifle less than a third of the length of the head. The upper line of profile from the base of the snout to the origin of the dorsal fin is slightly convex, very precipitate rising at an angle of 50°.

The soft portion of the dorsal fin together with the anal are rather strongly arched, both reaching a little posterior to the base of the caudal, and the former exhibits a slight angle in its hinder half. The ventrals are slightly pointed and when closely appressed to the belly their tips covers the vent. The pectorals are about one-fourth as long as the entire fish, and the caudal is truncate.

The ground color is lemon yellow, and the sides of the body are regularly

cancellate by numerous oblique obscure copper red lines, which form lozenge-shaped compartments of the same size as the scales. The ocular band is dark black tapering upward from the eye to the origin of the dorsal fin, and downward as far as the throat. The forehead and a spot in front of the eye, dun color. The spiny portion of the dorsal is soiled yellow, and its soft portion is marked by a large oblong copper-red spot, and a black intra-marginal band, edged with a white thread-like line. The basal half of the anal fin is dotted with copper-red, and its outer half is traversed by a broad band of the same hue, which is edged with white and black thread-like lines. Pectorals colorless. Ventrals and spiny portion of the anal yellow. The caudal is yellow with a wide colorless posterior margin and ornamented with a vertical black bar which tapers either way from the middle.

Length 4 inches

Hab. Viti Isls.

418

Chaetodon rafflesii

77

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Chaetodon? mertensii

Chaetodon guttatus, Garrett.

D. 13-23; A. 3-18; V. 1-5; P. 16; C. 2,1,8,2,1,2.

Form roundish oval. Scales on the body large. Head comprising nearly a fourth of the total length. Snout prominent, pyramidal in shape. The upper line of the head rising at an angle of about 60°. Eyes large, sub-circular in shape, situated nearer the end of the opercular angle than to end of snout, and their greatest diameter entering a little more than three times in the length of the head. A slight depression between the two portions of the dorsal fin, the soft portion presenting a vertically convex margin, which projects back as far as the base of the caudal. The margin of the anal is vertical, and straight along its edge, which with the nearly vertical dorsal gives the fish a truncate appearance. Ventrals slightly pointed. Caudal with a truncate posterior margin.

Color bluish-white. The posterior portion of the body, the soft dorsal and the hinder half of the anal, rich orange-yellow. Sides of the body with several vertical, slightly bent, black stripes which have jagged margins. Upper half with irreg-

ular angulated grass-green spots. The ocular band is small, black, margined with clear white and tapering downward from the forehead as far as the lower edge of the preopercle. Irides yellowish-white. Ventral, and the spinous portion of the dorsal stained pale greenish. The soft part of the dorsal, and the anal margined with lemon-yellow and an intramarginal deep brown thread-like line. Caudal trunk, and the basal portion of that fin bluish-white, the middle with a vertical crescent-shaped rich orange bar, with its convex margin anterior, and its concave edge separated from the posterior lemon-yellow margin by a deep brown thread-like line.

Length, 5 inches.

Habitat. Paumotu Isls.

Remarks. This species is common at the Paumotu Isls.

Chaetodon mertensii

taf. 36
fig. B.

[Chaetodon lineolatus

Chaetodon ~~tombifrons, Garrett~~

D. 12-27; A. 3-22; V. 1-5; P. 16; C. 4, 1, 8, 7, 1, 3.

Form oval. Scales large. Muzzle produced, sub-conical. Head comprising a fourth of the total length. Occipital region prominent and rounded, causing a marked concave depression upward and forward of the eyes. Eyes large, oval, their greatest diameter one-fifth the length of the head. The dorsal fin is rather low in its spiny portion, the soft part deep, and, together with the anal posteriorly angulated, the angles reaching beyond the middle of the caudal fin. When the caudal is expanded its posterior margin is convex.

The ground color is bluish white. Ocular band black, broader than the eyes, passing under the throat, and the upper portion strongly curved and passing over the forehead. A narrow branch of the band crosses the interocular spaces. Sides of the body with numerous oblique black lines which are directed downward and forward, the greater number springing from a large deep black bar, parallel and

contiguous to the soft dorsal base. The bar tapers downward to a point as far as the middle third of the anal base, and is shaded off with yellow. Sides silvery-yellow. Pectorals colorless. Ventrals white. All the other fins lively yellow. The soft dorsal and anal with a thread-like black edging which runs as far as their angles; the former nearly covered by two diffuse orange-red bars, the upper much the larger. The caudal fin has a posterior intramarginal blackish streak, outside of which the fin is colorless.

Length, 12 inches.

Habitat. Sandwich Isls, Society Isls, Kingsmill Isls, Paumotu Isls.

Remarks. This is decidedly the largest species of Chaetodon we have seen, and cannot be confounded with any other inhabiting these seas. The Sandwich Islanders call it "Ka-pu-hi-li."

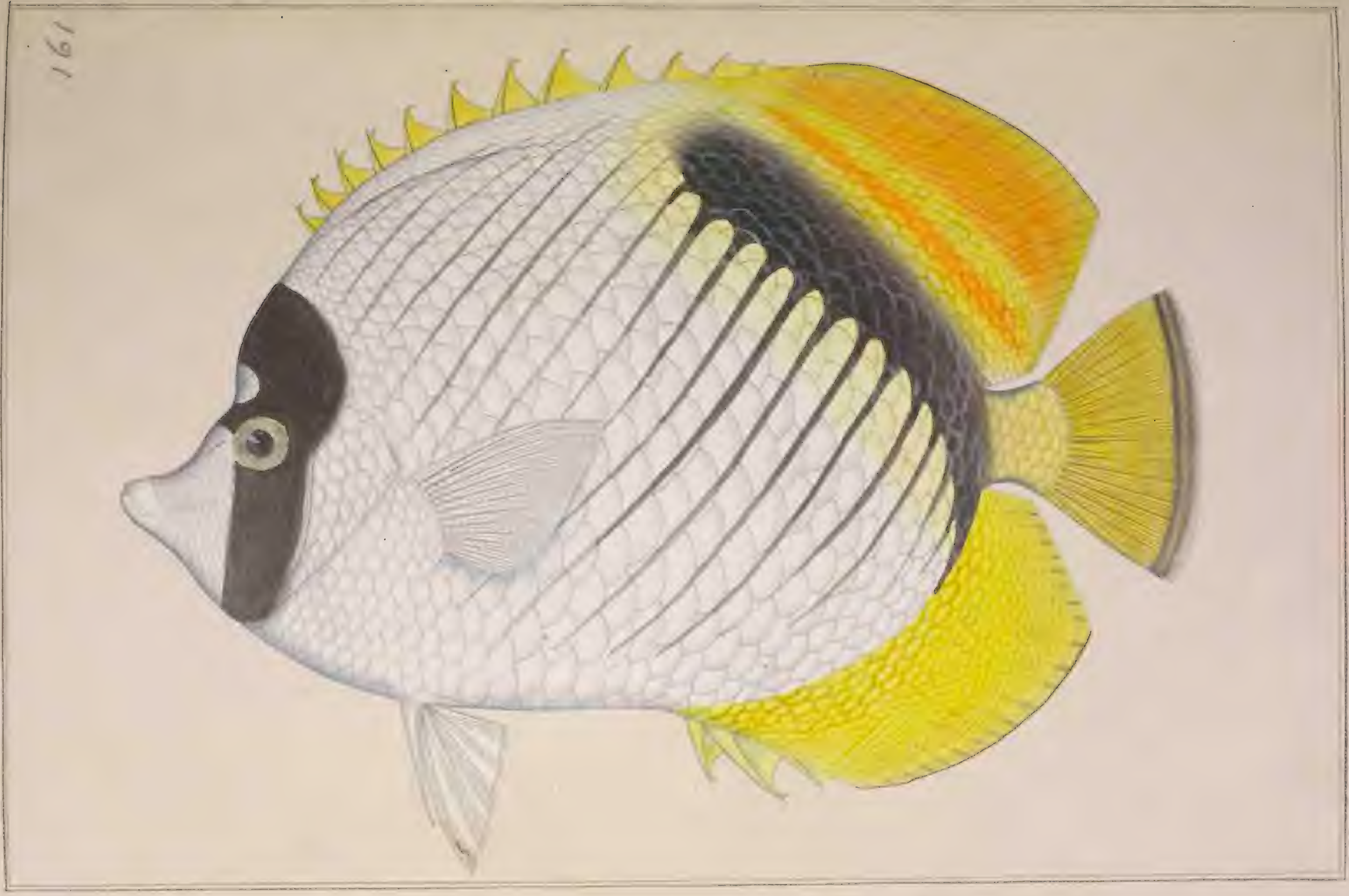
Unterschrift von Tafel 34

A. Chaetodon lineolatus. B. Chaetodon multicinctus.

Beide Figuren zu copiren, wie sie sind.

62

161



79

Chaetodon lineolatus

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Chaetodon miliaris

Chaetodon miliaris, Quoy et Gaim.

Chaetodon miliaris, Quoy et Gaim., Zool. Voy. Freycinet, p. 380, pl. 62, fig. 6.
" " Cuv. et Val., Hist. Nat. des Poiss., vol. 7, p. 28
" " Eyd. et Souley., Zool. Voy. Bonite, vol. 1, p. 163, pl. 2, fig. 2.

D. 13-23; A. 3-20; V. 1-5; P. 14; C. 2, 1, 8, 7, 1, 2.

The general aspect of this species is roundish-oval. In the central portion of the body the scales are large. The head constitutes a fourth of the total length. Snout slightly produced. Eyes large, their diameter being one-third the length of the head. The dorsal and anal fins are rounded. Caudal fin truncate.

Color yellow, which color is more intense in the fins. Sides marked with vertical rows of small roundish purple spots, which become fainter beneath and posteriorly. Caudal band black. Ocular band black, wide above the eyes and tapering beneath. Sides pale straw-yellow with dusky shades; a black thread-like line along the edge of the soft dorsal and anal. Ventrals whitish.

Length 4½ inches.

Habitat. Sandwich Isls.

Remarks.— A common species, called by the Sandwich Island natives "Kalaikau". Both figures, in the plate of the Zoology of the "Uranie" and "Bonite," give no idea of the colors of this species. That in the Bonite is the best in outline, but the markings are dark blue, together with most of the head, the margins of the ventrals and caudal. The short Latin description does not agree with the fish. "Uranie's" figure and description does not agree either with the fish or with the "Bonite's" figure & description. In the latter work it is called "Manini" which is the native name of the Acanthurus triostegus.

Chaetodon miliaris

80

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NATURAL HISTORY MUSEUM

33 Chaetodon citrinellus

Chaetodon millipunctatus, Garrett.

D. 14–22; A. 3–19; V. 1–5; P. 15; C. 3, 1, 6, 5, 1, 3.

Form oval. The head, which constitutes about a fourth of the total length, terminates in a pyramidical shaped snout, and rising upwards at an angle of about 50°. The inter-orbital space is prominent. The eyes are large, ovalish in shape, their horizontal diameter entering just three times in the length of the head, and once in advance of their orbits. Preoperculum margin smooth. The dorsal fin commences a little in advance of the opercle corner, and a slight depression may be observed along the middle of its upper margin. Its soft portion, together with the anal are angulated on their hinder halves. The caudal when expanded presents a rounded convex margin. The scales on the middle portion of the body are large.

Color lemon-yellow. Each scale on the body and fins marked with a semi-violaceous dot, which gradually fading beneath, and becoming orange posteriorly. The ocular fascia is brownish-black and extends from the forehead down to the throat, that portion above the eye is margi-

ned with yellowish-white and beneath with bluish-white. The spiny portion of the dorsal is steel-blue, tipped with yellow, and its soft portion is margined, as far as the angle, with white, which is separated from the ground color by a black thread-like line. The anterior two-thirds of the anal, or as far as the angle is widely margined with black; contiguous and parallel is a still broader band of whitish yellow which tapers to a point at the angle. Ventral yellowish-white. Pectoral colorless. Caudal umber yellow.

Length, 4 inches

Habitat — Society Isls, Paumotu Isls.

Remarks. — This species somewhat resembles *Chaetodon* miliaris, of Quoy and Gaimard, found at the Sandwich Isls. In the latter the dots are larger and inclined to assume regular rows. They differ in the shape of their vertical fins, which, in our fish present an angulated dorsal and anal while in the *miliaris* they are deeper and more rounded. The caudal trunk of the latter species is black.

Chaetodon citrinellus

81

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NATURAL HISTORY MUSEUM

Chaetodon strigatus

Chaetodon ? No 144

B. ?; D. 11-?; A. 3-?; V. 1-5; P. 14; C. 3/1, 8/1, 7/1, 2.

Of this rare fish two examples came under my notice at a time when I had but little knowledge of the science of Ichthyology, consequently I find my notes so imperfect that I am unable to decide with certainty whether it is a true Chaetodon or belongs to the family Pomacentridae.

The general outline is sub-oval strongly compressed, and covered with rather small scales, which extend on the muzzle and ascend nearly to the extreme margins of the soft dorsal, anal and caudal fins. The lateral line is arched and terminates at the base of caudal fin. The ventral outline from the throat to the origin of the anal fin is gently arched, and the upper line from the interorbital space to the dorsal fin is very precipitately convex and rises at an angle of about 55°. The muzzle is produced, abbreviatedly conical in its outline and together with the head comprises a fourth of the fish. The eyes are large, horizontally oval, situated rather nearer the end of the snout than the hinder opercle angle, and the median line of the body intersects their upper third. Just in front and approximating the orbits may be seen two nasal apertures, the anterior one small, circular and slightly tubular, the other large and obliquely oval. The mouth is small and the large preoperch border is rather strongly denti=

culated, the spines more developed on the rounded corner.

The dorsal fin commences immediately over the hinder angle of the opercular bone, and the spinous portion which is much deeper than the soft part occupies about two-thirds of the fin, and the fourth spine is the tallest, the others graduated either way so as to give the outline a considerably arched appearance. A slight emargination divides the two portions, the soft part being rounded off posteriorly. The anal fin is a trifle less than half as long as the dorsal and shaped somewhat like its soft portion. The ventrals are long, pointed, and their tips reaches the anal fin. The caudal exhibits a rather deep posterior emargination.

The ground color is grayish white, with a slight yellow tinge on the lower parts of the head and breast. The sides are fasciated with 5 oblique dark olive green bands which are wider than their interspaces. Their arrangement can be best understood by consulting the figure. A narrow tapering blackish stripe extends from the anterior limb of the orbit to the snout. Irides yellow varied with brown. Vs. and Ps. nearly colorless, the former tinged yellow. The spinous dorsal clouded with black and the soft portion and anal with a narrow yellow margin.

Length 6 inches.

Hab. Sandwich Isles.

82

Chaetodon strigatus

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Chelmon longirostris, Brouss.

Chaetodon longirostris, Broussou, Ichth. Dec. 1, n. 6, t. 7.
" " Gmelin, Syst. Nat. tom. 1, p. 1264.
Chelmon longirostris, Cuv. et Val., Hist. Nat. des Poiss.

D. 12–24; A. 3–19; V. 1–5; P. 14; C. 3, 1, 8, 7, 1, 2.

The head constitutes a little more than one-third of the entire length of the fish. The upper line of the head is precipitately convex, rising from the snout to the origin of the dorsal fin at a angle of about 55°. The eyes are large, subcircular in shape, and their greatest diameter being about one-sixth the length of the head. The snout is long and slender, measuring to the eye, it equals one-fourth of the entire length, caudal fin excluded. The preopercle is finely denticulated.

The dorsal fin takes its origin immediately above the commencement of the lateral line, and the fifth spine is the tallest. The outer margin of the soft portion of the fin is obliquely vertical. The anal fin is much deeper than

the soft dorsal, and its anterior portion is rounded along its margin; its posterior half is nearly vertical. Ventrals very long and acuminately pointed. The pectorals are also very long and sub-falciform. The caudal has a posterior angular emargination.

Color rich orange or lively yellow. The upper half of the head and the top of the snout are deep brown, paler on the temples. The breast and the lower half of the head, bluish-white. Sides clouded with brown and silvery-white. All the fins, except the pectorals and caudal, which are colorless, are rich yellow. A black spot marks the hinder end of the anal fin. A dusky shade along the margin of the soft dorsal.

Length, 6 inches.

Habitat.—Sandwich Isls, Society Isls, Kingsmill Isls, Paumotu Isls.

Remarks.—We have collected this curious fish at all the above mentioned localities, though not abundant at either. They are rarely caught by the natives.

83

Chelmo longirostris

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Heniochus macrolepidotus, Lin.

Tarel orch, Ruysch, Theat. Pisc. Amboin.,
p. 1, n. 1, pl. 1, fig. 1.

Ikan Bampus Terelae, Valent. Ind., vol. 3, p. 448,
no. 324, fig. 324.
Klein, Pisc. Miss., vol. 4,
p. 37, pl. 12, fig. 2.

Bezaan, Renard, Poiss., vol. 1, pl. 3, fig. 18.

Chaetodon ossiculis pinnae dorsalis, Gron., Mus.,
vol. 2, p. 32, no. 184.

Chaetodon fasciis tribus fuscis, Lin., Mus. Regi-
-nae., p. 63, pl. 33, fig. 3

Chaetodon spina pinnae dorsalis, Lin., Syst.
Nat., Ed. 10 gen. 140. no. 12.

Chaetodon macrolepidotus, Linn., Seba, Mus.,
Vol. 3, p. 66, pl. 25, fig. 8.

Chaetodon maxillis productis, Gron., Zooph., p.
69, no. 284.

Chaetodon lineis utrinque duabus nigris,
Artedi, Spec. 94

Chaetodon bifasciatus, cauda truncata, Bloch,
Ichthy., Vol. 3, p. 63, pl. 200, fig. 1.

Chaetodon macrolepidotus, Linn., (Gmelin)
Syst. Nat. p. 1247.

Heniochus macrolepidotus, Cuv. et Val.,
Hist. des Poiss., Vol. 7, p. 93.

"" "" Temm. et Schl. Fau. Japon.

p. 59, pl. 44, fig. 1.

Heniochus macrolepidotus, Richardson, Rep. Brit. Ass., 1846, p. 246.

L. 5; D. 11-26; A. 3-19; V. 1-5; P. 16; C. 3,1,5,7,1,2.

The head comprises two-sevenths of the entire length of the fish. The upper line of profile is precipitately convex rising from the prominent interocular spine to the origin of the dorsal fin at an angle of 65°. The eyes are sub-circular, their greatest diameter equal to one-third of the length of the head, and inserted just midway between the hinder corner of the operculum and the end of the snout. The upper anterior crest of the orbit are denticulated. The fourth spine of the dorsal is excessively prolonged into a slender whip-like filament, which is longer than the entire fish. The interradial membrane is continued high up on the filamentous ray. The succeeding seven spiny rays are entirely filled with membrane and slightly depressed in outline. The soft part of the fin is rather strongly arched, and the anal is acutely rounded. The caudal is slightly concave posteriorly.

Color silvery-white, with two broad black zones. The first one extending from the anterior third of the dorsal fin, form-

ing a gentle oblique curve to the lower line of the belly. The posterior one which is more oblique starts from the hinder half of the spiny dorsal and terminates on the posterior half of the anal fin. The top of the snout and interocular space, black. Sides yellowish-silver. Ventrals and ~~the~~ the spiny portion of the anal, black. The soft dorsal, caudal and pectoral rays, yellow.

Length, 6 inches.

Habitat. Society Isls, Kingsmill Isls, Paumotu Isls, Japan, East Indies, Celebes, Mauritius, Mozambique.

Remarks. The long whip like filament, two instead of three bands, will distinguish this species from H. chrysostomus.

Heniochus macrolepidotus

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Heniochus monoceros.

Heniochus fronticornis, Garrett.

D. 12-25; A. 3-17; V. 1-5; P. 17; C. 3, 1, 8, 7, 1, 2.

The head constitutes more than a fourth of the total length. Eyes oval, their greatest diameter nearly a third the length of the head. Orbital tubercle very prominent. The prominent and rounded forehead is armed with a short conical horn which projects anteriorly. The fourth spiny ray of the dorsal ends in a tapering filament. The posterior spines entirely filled with membrane. Soft dorsal and anal rounded. Caudal with a slight concave emargination on the middle third of the hinder margin.

Color grayish-white. Two broad, vertical bands on the side of body, the ventrals, spiny portion of anal, and the anterior half of the head, black. The anterior band, which fills the whole abdominal space, tapers upward, enclosing the pectorals and terminates on the middle of the spiny portion of the dorsal. The posterior band, which is narrower, more oblique, paler, does not ascend so high and covers the posterior half of the anal fin. The end of the snout, a spot on the

interocular space, and angular transverse band beneath the horn, and the elongate portion of the dorsal, white. The occipital region brownish-yellow, passing into brown above. Irides silvery. Caudal, pectorals, posterior portion of the dorsal and the anterior half of the anal, yellow.

Length, 9 inches.

Habitat. Society Isls.

Remarks. A very rare species, of which we have seen but one example. Its frontal horn will distinguish it from the preceding two species. It may possibly be the Heniochus monoceros, of Cuvier and Val., which occurs at Mauritius.

Hemiochus monoceros

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0 1 2 3 4 5 6 7 8 9 10 cm
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?Heniochus monoceros, var.

Heniochus. No 451

D. 12-27; A. 3-20; V. 1-5; P. 17; C. 2, 1, 7, 1, 2.

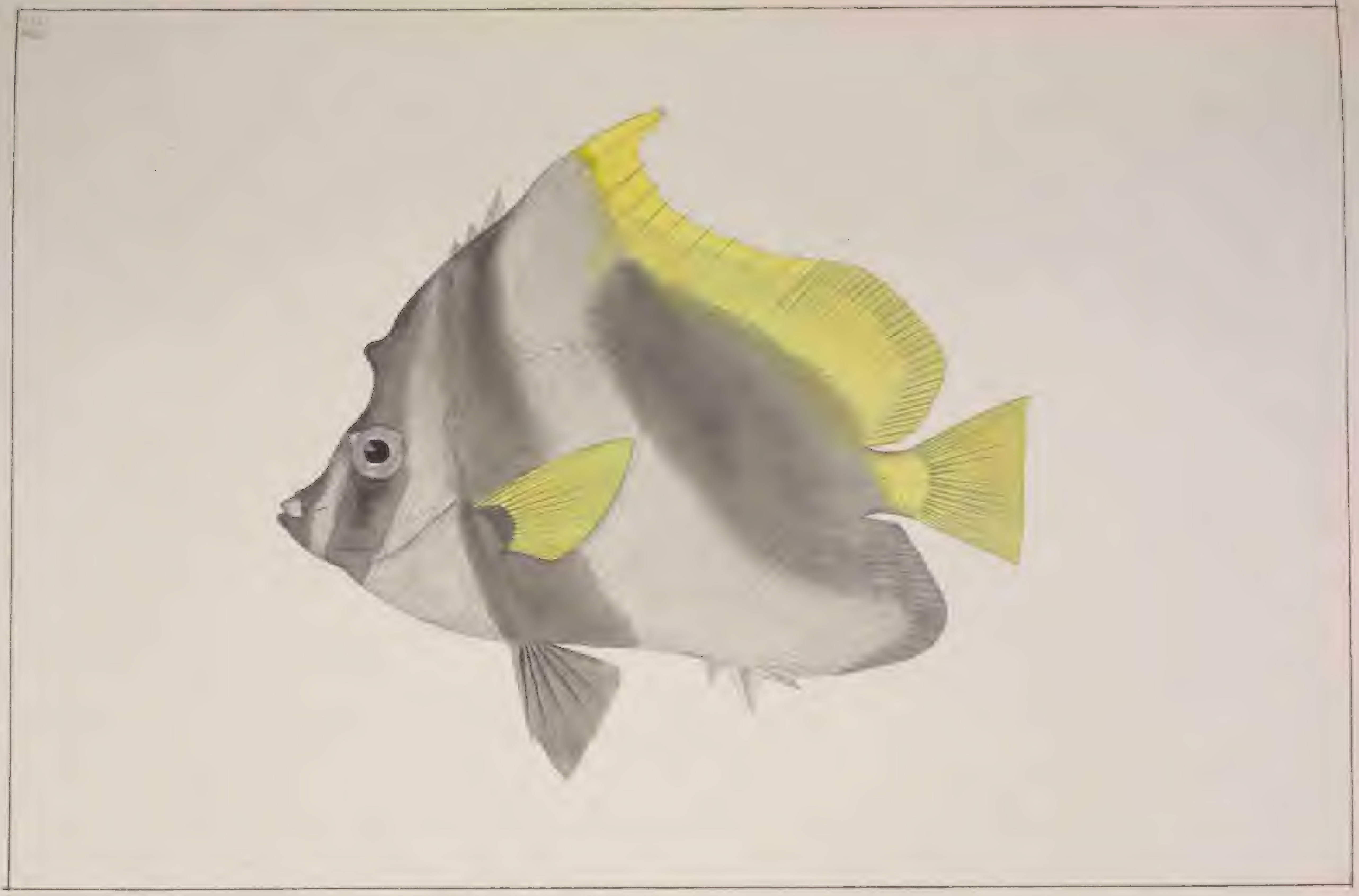
Color silvery grey anteriorly and dusky grey in the middle of the body. The snout, ocular band, a zone extending from the three anterior dorsal rays to the abdomen, the ventrals and a large oblique patch on the hinder part of the body black; the latter curving down along the margin of the anal fin. Irides dusky. The pectoral, caudal, part of the caudal trunk and dorsal yellow.

The head comprises a little less than a fourth of the total length and the large subcircular eyes are about the same proportion to the length of head. The snout is abbreviately pyramidal, the interocular space convex and the forehead precipitately arched. Above the eye is a stout compressed tubercle projecting anteriorly, the upper anterior margin of the orbit is armed with a stout acute tubercle which projects laterally. The fourth dorsal spine is compressed and appears to be (broken off in the specimen before me) drawn out into a long filament. The spinous portion of the dorsal behind the fourth or compressed spine, is deeply concave, and the soft

portion is arched, with a slight angle when it bends down to the tail. Caudal truncate. Anal acutely rounded.

Length 8 inches.

Hab. Viti Isl.



Heniochus monoceros

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Heniochus chrysostomus, Solander

Chaetodon chrysostomus, Solander, MS.
Heniochus chrysostomus, Lay et Bennett, Zool. Voy. Blossom, Fishes, p. 62, pl. 18, fig. 1.

B. 5; D. 12–25; A. 3–19; V. 1–5; P. 15; C. 5, 1, 8, 7, 1, 2.

The head comprises two-sevenths of the entire length. The eyes are circular, their diameter being one-third the length of the head, and situated just midway between the end of the snout and the hinder termination of the operculum. In addition to the horn-like tubercles, the upper limbs of the orbits are denticulated. The upper line of the head is very steep, rising from the interocular space at an angle of about 65°.

The fourth spine of the dorsal fin is nearly as deep as the body, being followed to its tip by a narrow strip of membrane. The fifth spine is about one-third as long as the fourth, the others rapidly diminishing in altitude, and all have their interradial membranes profoundly notched. A very deep concave depression between the two portions of the fin, of which the soft part is arched.

The anal fin passes over a base equalling the length of the head, its depth falling a little short of the former, and in outline is acutely rounded. Caudal slightly emarginate on its posterior edge.

Color grayish-silvery, with three broad blackish-brown zones disposed as follows: the anterior one starts from the upper portion of the head, filling the whole space between the orbits and origin of the dorsal fin, curving downward, nearly enclosing the eye and base of pectoral and terminating on the belly. The middle one curves downward and backward through the middle of the body, running high up on the tall portion of the dorsal, and down to the lower margin of the anal fin. The third band covers the soft dorsal base. Top of the muzzle brown and tipped with golden-yellow. Ventral black. Anal tinged yellow. Dorsal whitish. Caudal rays golden-yellow. Pectorals colorless.

Length, 6 inches.

Habitat.—Society Isls. Paumotu Isls.

Remarks.—At the former group this fish is called "Tihitihi" or "Teue"

xxxix fish

Heniochus chrysostomus

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Holacanthus diacanthus

Holacanthus ~~guttatus,
 Benn.~~

B.4; D. 14-19; A. 3-18; V. 1-5; P. 14; C. 3, 1, 8, 7, 1, 2.

Form oblong-oval. Scales moderate. The greatest depth of the body is half of the total length, caudal excluded. The head, which comprises a fourth of the fish, excluding the caudal, is convex above. Eyes large circular, their diameter about one-third the length of the head. The preopercle exhibits three small spines on its lower edge. The lateral line terminates at the hinder base of the dorsal fin. The membrane between the first and second spine of the dorsal is notched, while the posterior are entire. The soft part of the fin angularly-rounded. The anal is a little more than half the length of the dorsal, strongly arched, and deepest at the eighth or ninth articulate ray. Ventrals pointed.

Body bluish-white, crossed by eight, more or less curved orange stripes which are shaded off with black. The anterior stripes are the most curved, all, except one across the caudal trunk, converge on the posterior half on the dorsal fin, and beneath they terminate on the anal base.

Head brown, darker above and [illegible] orange posteriorly. Lips orange. Opercular pieces margined with blue, which on the opercle curves upward and backward on the dorsal fin. A few small spots on the muzzle, and a line running from the lower edge of the orbit to the first spine of the dorsal, blue, edged with black. Sides buff yellow. Spiny dorsal vermilion-red, the soft portion blackish, darker centrally, edged with blue, and the latter part of the fin is covered with blue dots and short curved broken lines. Caudal orange. Anal brilliant red, edged and striped with rich blue, the latter arched and more or less flowing into the body fasciae. Ventrals orange-yellow.

Length, 7. inches

Habitat. Society Isls, Paumotu Isls.

Remarks. A rare and most splendid species characterized by the curved orange colored stripes.

88

Holacanthus diacanthus

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Holacanthus bispinosus

Holacanthus strigosus, Garrett.

B. 4; D. 13-17; A. 3-17; V. 1-5; P. 15. C. 1.

Form oblong oval, and regularly arched above and beneath. Scales rather large. The head is about half as long as the body. Eyes large, circular, their diameter equal to one-third the length of the head. The preopercle covers the interopercle, and has in addition to the corner spine, two smaller ones beneath which are directed backward. The lateral line runs to the caudal base. The soft portion of the dorsal fin is angularly rounded. The anal is half as long as the dorsal and arched along its lower edge.

Color plumbeous purple. The middle third of the body is marked with irregular defined blackish-purple vertical stripes, which become orange-red above and beneath. Similar orange red stripes encircle the head. Spinous dorsal dusky orange. The soft dorsal, anal and caudal deeper colored than the body, edged with blue and reticulated with orange-red. Pectoral orange-red, becoming yellow posteriorly. Ventrals yellow.

Length, 5½ inches.

Habitat.—Sandwich Isls.

Remarks.— Of this very rare species we have seen but one mutilated example, which was deprived of its caudal fin. The latter organ we have reproduced in the drawing, being guided in its structure by other species. Like H. armatus it has three long perpendicular spines.

?Holacanthus bicolor, var.

89

169?

Holacanthus No 163.

Sandwich Isls.

Having lost my notes of this species I cannot give any detailed description.

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? Holacanthus bicolor

Holacanthus bispinosus

Holacanthus lateolus?
Holacanthus cyanotis

Holocanthus No 403

B. 4; D. 14/17; A. 3/17; V. 1/5; P. 16; C. 2,1,8,7,1,3.

This species is of an ovate shape, the dorsal arch more elevated than the ventral, and the greatest depth of the body is just half of the total length, the caudal excluded in the measurement. The head comprises about two-thirds of the fish, and its upper line of profile is precipitately convex, rising up to the dorsal at an angle of 45°. The eyes are large, circular, their diameter entering three and a half times in the length of the head, and inserted so that their lower border touches the median line of the fish. The preoperculum, which reaches downward as far as the lower line of the gill opening, is armed with two stout slightly curved spines, the upper contiguous to, and twice as long as the lower one. The hinder margin of the preoperculum is nearly vertical and denticulated. The scales are of rather large size.

The dorsal fin arises immediately above the hinder corner of the operculum and passes over a base a trifle more than half the total length of the fish. It is slightly arched above, the rays gradually increasing in height as far as the posterior third of the soft portion, whence they rapidly diminish so as to give that portion a rather sharp angle which reaches as far back as the middle of the caudal fin. Its soft portion is a trifle less than

a third of the whole length of the fish. The anal fin, which is nearly half as long as the dorsal fin, is shaped like its soft portion, with which it coterminates. The ventrals are large, pointed, and when appressed to the belly their tips touch the anal fin. The pectorals are shorter than the ventrals.

Color rich orange yellow, paler beneath, and the eyes golden yellow with a cloud-like brown ring. The opercular margin, a ring round each eye, and the extreme borders of the soft dorsal, anal and caudal, light blue. The three latter fins with a fine intramarginal black line. The pectorals, ventrals, spinous portions of the dorsal and anal fins yellow. Sometimes an orange-red spot marks the opercular flap.

Length 4 inches.

Hab.– Kingsmill, Society, Paumotu, Hervey, Samoa and Viti Isls. (Garrett)

90

Holacanthus cyanotis

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Holacanthus loriculus

Holacanthus armatus, Garrett

B. 4; D. 14-15; A. 3-17, V. 1-5; P. 14; C. ?.

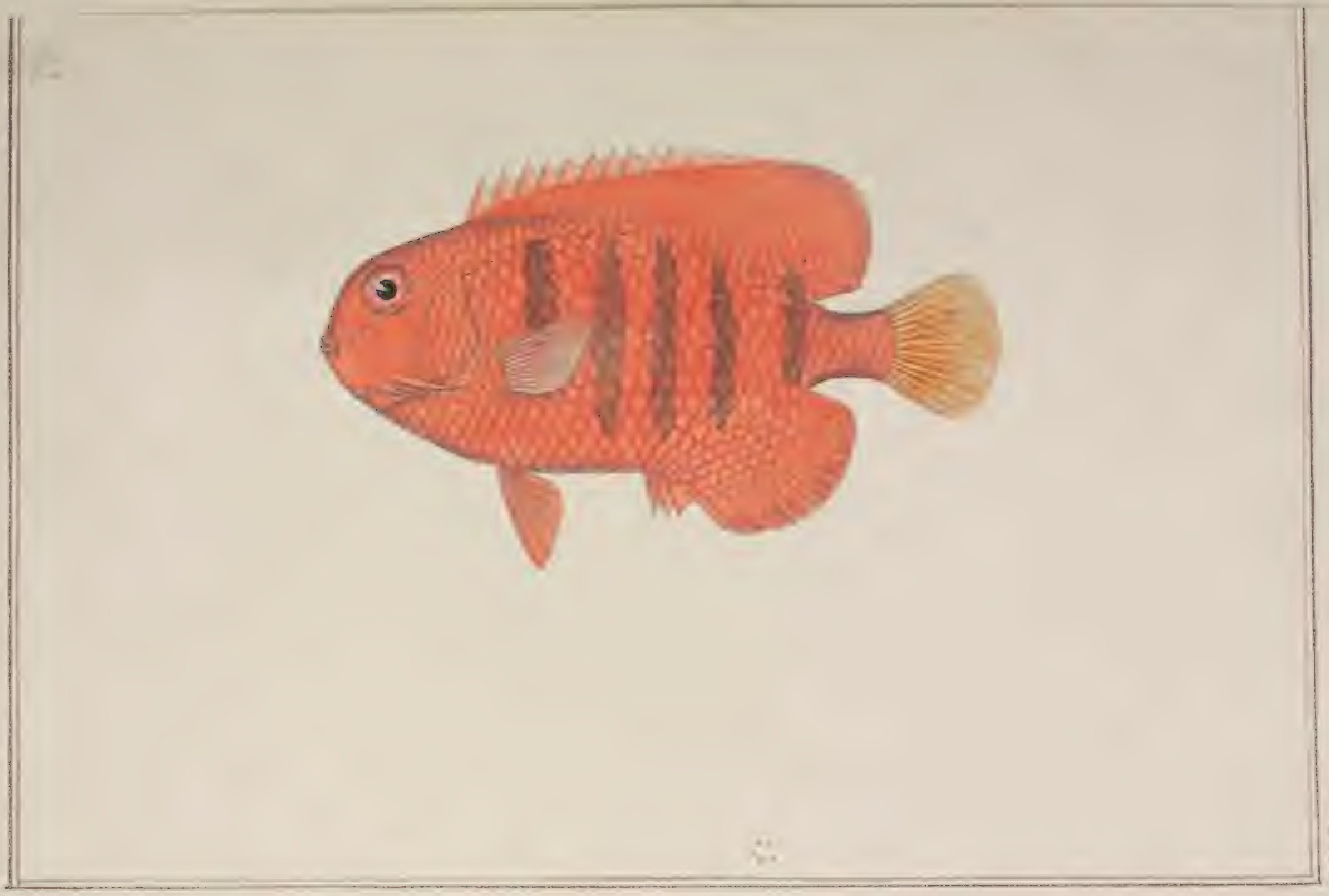
Of this species I have seen but a solitary mutilated specimen, which I discovered in the stomach of a large Serranus. Its general outline is oblong-oval, being similarly arched above and beneath, and the greatest depth of the body is one half the total length of the fish, caudal excluded. The head, which comprises a little less than one-fourth of the total length, is gibbous above. The eyes are large and circular, their diameter being a trifle more than one-third the length of the head. The suborbital is armed with five slender spines, which are directed obliquely downward and backward. The hinder margin of the preoperculum is furnished with small irregular sized spines, and the lower margin with two long ones which curve backward. The lateral line approximates the back and terminates at the hinder end of the dorsal base. The soft part of the dorsal fin is rounded along its margin. The anal passes over a base half as long as the dorsal and is gently arched in outline.

Color uniform vermilion-red, except the caudal which is orange-red. Sides of the body with five vertical nearly equidistant blackish stripes which do not reach the dorsal or ventral lines of the body.

Length, 2½ inches.

Habitat. Society Isl.

Remarks. The infra orbital spines, the red color and vertical stripes will easily determine this species.



Holacanthus loriculus

Holacanthus imperator

Holacanthus ~~magnificus, [illegible]~~

B. 7; D. 13-19; A. 3 19; V. 1-5; P. 19; C. 2,1,2,2,1,1.

The general shape of this fine-looking species is oval, and the scales of moderate size. The head constitutes two-ninths of the total length, precipitately convex above the interocular space, which latter is prominent. The eyes are circular, situated nearer to the opercular corner than to end of snout, and their diameter entering four times in the length of the head. The lateral line is continuous to the base of the caudal. The dorsal fin gradually increases in height as far as the middle of the soft part, where the rays are prolonged into a filament reaching as far back as the hinder edge of the caudal. Behind the filament the margin of the fin is vertically convex. The anal passes over a base nearly one-third the length of the fish, and is regularly arched in outline. The ventrals are prolonged into a filament.

Color: body violaceous becoming intensely so in the soft part of the dorsal fin. Abdomen brownish-yellow. Head and breast light-brown. The

violaceous ground is closely lineated with sulphur yellow; the lines running backward and upward. An oblong vertical black patch on the shoulder, which is posteriorly margined with sulphur-yellow. Opercle margined with violaceous-blue. A black band bordered with violaceous-blue, crosses the interocular space, enclosing the eye and tapering down to the preopercle spine. Irides yellowish silver. Spinous dorsal bluish white; the soft portion margined with white in front of the filament, which latter is orange, and the posterior half is margined with blue, and an intramarginal black line. Caudal orange. Pectoral rays dark olive. Anal blackish posteriorly, becoming paler anteriorly, margined with blue, and longitudinally lineated with blue dark margined lines. Ventrals edged anteriorly with violet, rays orange.

Length, 10 inches.

Habitat.— Society Isls. Paumotu Isls.

Remarks.— Of this magnificent species we procured a single specimen at each of the above locations.

Holacanthus imperator

Holacanthus nicobariensis.

Holacanthus nigricans, Garrett.

B.4; D.14–22; A.3–21; V.1–5; P.15; C.1,1,8,7,1,1.

The general aspect of this Holacanthus is oval, and the scales are much smaller than usual in the genus, feeling velvety when the hand is drawn anteriorly. The head comprises two-seventh of the entire length of the fish, and its upper line of profile is precipitately convex, rising from the snout at an angle of about 85°. Eyes large, circular, their diameter entering three times in the length of the head. The lateral line is continuous to the base of the caudal. The soft part of the dorsal and anal are rounded. The first articulate ray of the ventrals are prolonged into a filament. The pectorals are a little longer than the caudal, or equal to half the length of the anal base.

Color uniform black, variously lineated with white, which, on the fins are tinged with blue. On the head the lines are vertical, more or less curved and interrupted. On the body they curve backward, both above and beneath, more or less uniting on the soft part of the dorsal, and irregularly reticulated on the caudal trunk

and anal fin. Sides light coppery, with marginal white dots. Spinous part of the dorsal bluish steel, the soft part edged with white and the anal with blue. Caudal dusky. Pectoral rays, black. Ventrals black, with light blue streaks.

Length, 4 inches.

Habitat.—Society Isles.

Remarks.—A very rare fish at the Society Islands, where it is called by the natives "Paraharaha rautou" Its black color and peculiar limitations are very characteristic and will at once determine it from any other species.

Holacanthus nicobariensis

93

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Mulloides flavolineatus

Upeneus No 434

D. 8–2/8; A 2/6; V 1–5; P 15; C 3,1,7,6,1,3.

The greatest depth of the body, which is beneath the first dorsal fin, equals about two-ninths of the total length of the fish, of which the head comprises a fourth. The dorsal region is more strongly arched than the ventral line. Nine rows of scales exist between the first dorsal and abdominal region, and 7 on the side of the tail. The eye is large, rotundly-oval, its greatest diameter contains three and a half times in the length of the head, and just once this length in the space between the orbit and the origin of the lateral line, which latter is concurrent with the upper profile of the body.

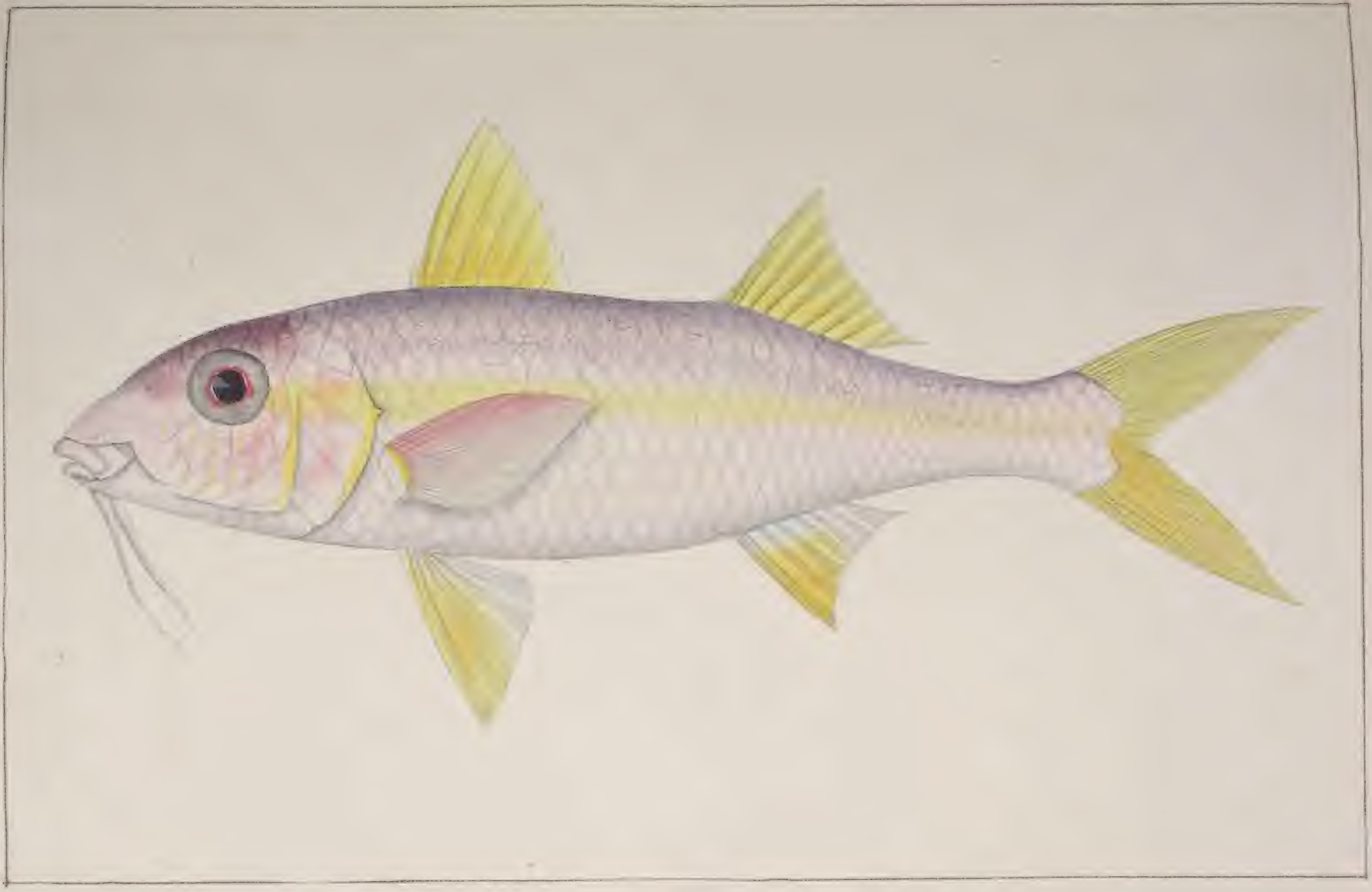
The first dorsal fin is of nearly equal length and height, but generally the latter slightly exceed the former. Both the soft dorsal and anal are slightly concave on their extreme margins, the former a trifle longer than deep, and the latter slightly deeper than length of base.

Color of the upper parts

pinky grey, passing into pinky white beneath. The scales above the lateral line more or less veined with pinky-red, a light yellow diffuse band extends from the eye straight to the base of the caudal fin. The top of the head is of a purple red tinge, the sides tinted with pinky-red, and a dash of yellow on the base of the pectoral fin, margin of the opercle, and preopercle, also some short pencillings of the same hue on the cheeks. Irides silvery or silvery blue with a pinky red zone next to the cornea. The two dorsals, caudle and the anterior portions of the anal and ventrals yellow. Pectorals light pinky-red.

Length 10 to 12 inches.

Hab. Society, Sandwich Isls.



91

Mulloides flavolineatus

U. barberinus.

Upeneus

#

B. 3; D. 8-9; A. 6; V. 6-; P. 17; C. 3, 1, 7, 6, 1, 2.

The greatest depth of the body as compared to the total length of the fish is as one to five, and the head constitutes nearly a fourth of the latter. The eyes are sub-circular their greatest diameter being two-thirteenth the length of the head. The third ray of the first dorsal is considerably prolonged above the second and third. All the other fins shaped very similar to U. multifasciatus.

Color along the dorsal region greenish slate; sides pinky or whitish pink; belly white. Scales deeper colored on their margins and seamed with darker. A black band extends from the eye, following the lateral line and terminating beneath the end of the soft dorsal. A black spot marks the posterior half of the caudal trunk. Irregular abbreviated violaceous stripes radiate from the eyes, and three yellow ones enclosing two blue ones extend from the orbit to the end of the snout. First dorsal more or less tinged with pink.

Actual colorless. Ventrals pinky-white; band dull reddish, becoming paler posteriorly. The second dorsal and anal are yellow, both obliquely striped with violaceous.

Length, 15 to 20 inches.

Habitat.—Kingsmill Isls, Society Isls, Paumotu Isls, Hervey Isls.

Remarks.—This beautiful fish may be easily known by the black fascia and spot.

95

Upeneus barberinus

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Family Mullidae, Garrett

This family is closely allied to Percidae by several anatomical and external characters. Their dorsals are far apart, and two long cirri depend from the symphysis of the lower jaw.

Genus Upeneus, Cuvier

Body elongate oblong, compressed. Scales large, easily dislodged, covering cheeks, opercular pieces, and exiguous ones on the caudal fin. Head well developed, sub-conical. A small spine on the opercle. Mouth small, oblique, but slightly cleft; upper jaw the longer; lips fleshy and bulky. Maxillary large. Teeth disposed in a single range, stout, conical and but few in number. Nostrils very far apart. Preopercle simple. Tubes of the lateral line numerous. First dorsal opposite the abdominal space, deeper than long, composed of slender flexible rays, which fold back into a dorsal groove. Second dorsal longer than deep. Anal opposite, similar, without spiny rays and more distant from the caudal. Ventrals

long, pointed and inserted beneath the pectorals. Pectorals sub-elliptical. Caudal bifurcate.

U. trifasciatus

Upeneus multifasciatus, Quoy et Gaim.

Mullus multifasciatus, Quoy et Gaimard, Freycinet, p. 330, pl. 59, fig. 1.

B. 3; D. 8–9; A. 8; V. 6; P. 17; C. 4, 1, 7, 6, 1, 3.

The greatest depth of the body is a little less than a fifth of the total length, which latter is eight times the greatest thickness. The head is nearly a fourth of the fish, caudal included. The upper line of the snout is convex. The eyes are oval, rather large, their greatest diameter entering about five times in the length of the side of the head and three times in advance of their orbits. The lateral line contains about thirty scales, and we enumerate 9 longitudinal rows in the greatest depth of the body.

The first ray of the spinous dorsal is minute, the second nearly as long as the third which is the tallest. The second dorsal tapers posteriorly and the last ray is longer than the preceding one.

The anal is not quite so long, but deeper than the dorsal, and of similar shape.

Color when dead, yellowish-creamy above, pinky-white beneath. Scales more or less veined with pinky-red. The upper parts with three diffuse brown, black saddle shaped bars, one beneath the anterior half of the first dorsal, the second between the two fins, the third just behind the second dorsal. Violaceous lines and small spots on the head, the former running from the eyes toward the end of the snout. Sometimes similar spots on the caudal trunk. Cirrhi light yellow. Irides silvery, shaded with pinky. First dorsal yellow with pinky-red shades. Base of the second dorsal blackish, smoky above where it is longitudinally faciated with pinky, margined chrome yellow stripes. Anal similar without the black base. Ventrals transversely striped with pinky red. Pectorals colorless. Caudal yellow, shaded with pink above and beneath.

<u>Length</u>, 10 to 12 inches.

<u>Habitat</u>. Sandwich Isls. Kingsmill Isls, Society Isls, Hervey Isls, Paumotu Isls.

<u>Remarks</u>. Common. Varies considerable in color, but the black fasciae will easily determine it.

Upeneus trifasciatus

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U. cyclostomus

Upeneus ~~luteus, Garrett~~

D. 8–9; A. 8; V. 6; P. 16; C. 3, 1, 7, 6, 1, 2.

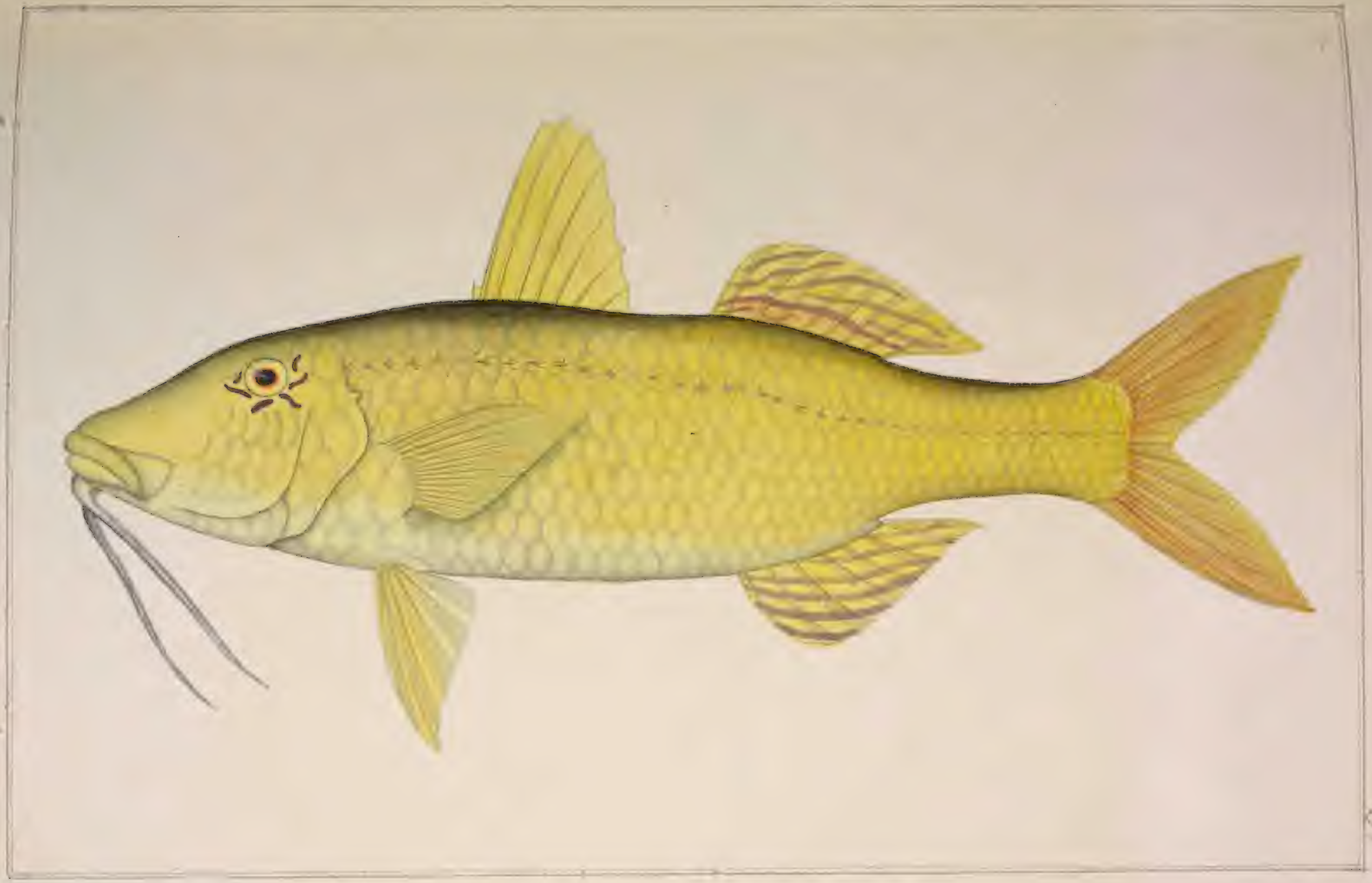
The greatest depth of the body is two ninth of the total length, which latter is four times the length of the head. Snout slightly concave above. Eyes oval, their length one-seventh that of the head. Cirrhi long, reaching nearly the ventrals. Fins shaped like U. multifasciatus, except the second dorsal and anal being longer, not so deep and the former more arched.

Color nearly uniform dark gamboge yellow. The scales in the upper parts veined with light red. Several elongate irregular violaceous spots round the eyes. Irides chrome yellow, with an inner ruby-red ring. Fins sometimes tinged with reddish, and some have the soft dorsal and anal obliquely striped with either chrome yellow or purple.

Length,—13 inches.

Habitat—Society Isls.

Remarks—We have seen some eight or ten specimens of this species.



Upeneus cyclostomus

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? U. cyclostomus var.

Upeneus

D. 8–9, A. 8; V. 6; P. 16; C. 3,1,7,6,1,2.

The greatest depth of body is a little less than a fifth of the total length. Eyes sub-circular, their greatest diameter one-sixth the length of the head. The fins are shaped like U. multifasciatus, but the last ray of the soft dorsal and anal is not longer than the preceding one.

Color a bluish tint, with a tinge of olivaceous on the upper part of the head, margins of gill covers and on the top of the caudal trunk. Scales on the upper half veined with darker. Purple lines radiate from the eyes some of which are continued down to the end of the snout. Barbels colorless tipped with yellow. First dorsal, ventrals and basal half of the soft dorsal olivaceous, the latter yellow above and obliquely fasciated with dark margined dirty steel stripes. Anal yellow with oblique blue margined steel stripes. Pectorals colorless. Caudal brown, paler posteriorly.

Length, 13 inches.

Habitat: Society Isles.

? Upeneus cyclostomus, Var.

Genus *Lethrinus*, Cuvier.

Body oblong, compressed. Head sub-conical; jaws even; lips loose and fleshy, the lower one united by a frenum to the symphysis of the lower jaw; teeth conical, stout, disposed in a single row, the front ones the longer. Sometimes there may be seen an inner band of villiform teeth on the hinder half of the jaws. Nostrils just in advance of the eyes, the posterior one furnished with a minute membraneous lid. Scales rather small, covering the opercle and a patch exists on the supra-tympanic region. Cheeks naked. Lateral line concurrent with the curvature of the back. A slight depression marks the two portions of the dorsal fin, of which the spinous is a little the longer. The anal which coterminates with the fin above is nearly, or as long as the soft part of the dorsal. Ventrals posterior to the pectorals. Caudal deeply emarginate or sub-bifurcate.

These fishes, which are excellent food, may be distinguished from Dentex by the absence of scales on their cheeks. They are more or less red about the jaws.

Lethrinus moensii Blkr

Lathrinus ~~major, [illegible]~~

B. 6; D. 10-9; A. 3-8; V. 1-5; P. 12. C. 5, 1, 5, 7, 1, 2.

The greatest depth, taken imme-diately behind the base of the pectoral fins, is, as compared to the total length, one to four. The greatest thickness tak-en at the same place falls a trifle short of half of the above mentioned depth. The head enters about three and a half times in the entire length of the fish. Its upper line of profile is nearly straight, rising at an angle of about 40°. The eye is well developed, of an oralish shape, approximating the upper line of profile, and its great-est diameter is about one-fifth of the entire length of the head. The scales are rather small, being disposed in twenty-two longitudinal rows be-tween the dorsal fin and the abdominal line, of which five rows exists above the lateral line.

The dorsal fin is rather low, commencing at a point corresp-onding to the hinder base of the pectorals; its spiny portion which is higher than the soft part, is the

tallest
at the third ray, whence it gradually diminishes in altitude so that the last spine is shorter than the succeeding articulated ray. The soft portion of the fin is posteriorly rounded off, and passes over a base which is a trifle more than half the length of the spiny portion. The anal fin is a little longer than the soft part of the dorsal and arched along its lower margin. When the ventrals are closely appressed to the belly they do not quite reach the vent. The caudal is posteriorly concave.

Color bluish gray, or pale greenish, clouded with light olivaceous, the clouds assuming more or less vertical bars. Upper portion of the head olive, and the interior of the mouth, tongue, labial sutures, under surface of the gill covers and pectoral axillae, deep orange-red. Irides yellowish-silver, more or less varied with brown. The fins are nearly colorless, though some have pale pink-red rays, and generally there may be observed light umber or pale olivaceous shades on the dorsal and anal fins, the latter frequently tinged with light

red along its inferior margin. The upper edge of the pectorals and the hinder margin of the caudal are tinged light red or orange.

Length. 3 feet.

Habitat. Society Isls, Hervey Isls, Kingsmill Isls, Paumotu Isls.

Remarks. An abundant and excellent fish. The specimen from which our drawing was made measured 18 inches in length. At the Society Isls its vernacular name is "Oeo-utu-roa" at the Kingsmills it is called a "Iron" a name used by the natives of the former group for the genus Merra. It is more slender than either the L. bifaciatus or L. gibbosus and attains a much larger size.

Lethrinus moensii

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Lethrinus ramak

Lathrinus ~~fasciatus, Smith~~

B. 6; D. 10-9; A. 3-8; V. 1-5; P. 12; C. 2, 1, 8, 7, 1, 1.

The greatest depth of the body equals the length of the head, which latter comprises one-third of the fish, caudal excluded. There is twenty-one longitudinal rows of scales in the greatest depth of the body, five of which are above the lateral line. The eyes are large sub-circular, their greatest diameter being one-fifth the length of the head.

The dorsal fin extends over a base half the length of the fish, excluding the head in the measurement. Its fourth spiny ray is the tallest, and there is scarcely any depression between its two portions. The anal fin is equally as long as the soft part of the dorsal. The ventrals are rather long, as are also the pectorals. The caudal is bifurcate for about half its length.

Color light grayish; scales with darker margins; a yellowish glass follows the course of the lateral line. The lower half of the body is traversed by two longitudinal diffuse buff-yellow bands. Irides bluish-silver.

Ventrals colorless. Pectoral rays pale reddish. Dorsal and anal steel-blue, tinged with reddish. Caudal absolutely reticulated with light blue.

Length, 8 to 10 inches

Habitat.— Kingsmill Isls.

Remarks.— A common species at the Kingsmill Isls, where it is called by the natives "Kotauta".

Lethrinus ramak

Lethrinus mahsena

Lethrinus gibbosus, Garrett.

B. 6; D. 10-9; A. 3-8; V. 1-5; P. 12; C. 4,1,8,7,1,3.

The greatest depth of the body is one-third of the total length of the fish. The dorsal region is rather strongly arched. There may be counted twenty longitudinal rows of scales between the dorsal and ventral lines of the body, five of which are above the lateral line. The head, owing to the prominent back is about equal in depth and length, which latter constitutes a fourth of the fish. The eye is large, oval in shape, its greatest diameter being two-ninth the length of the head. The upper profile of the head rises at an angle of about 50°.

The fourth spine of the dorsal fin is the tallest, and both portions are slightly arched in outline. The ventrals are long, acuminately pointed by the prolongation of their first articulated rays, and when the fins are closely appressed to the abdomen, their tips reaches beyond the origin of the anal fin. The pectorals are also long and acuminately pointed.

The caudal is bifurcate, the lobes oblong triangular in shape.

Color bluish-white; scales with darker margins and tinged centrally with yellow. Head more or less clouded with purple brown. Sutures of the lips and gill cover more or less tinged with light red. Irides silvery, tinged with brownish-yellow. Dorsal fin more or less shaded with light red. Anal straw-yellow, shaded with light red along its lower margin. Ventral colorless. The hinder margin of the caudal and the rays of the pectorals, light yellowish.

Length, 15 inches.

Habitat.– Hervey Isls, Paumotu Isls.

Remarks.– Its most prominent character is its gibbous back. Its name at the former location is "E-mu."

Journal des Museum Godeffroy. Heft.

Fische der Südsee. Heft III. Taf. 48.

Unterschrift:

Lethrinus mahsena.

NB. Auf dieser Tafel ist die Zeichnung in Bleistift für die Originalflossen zu substituiren, u. der Lithograph hat namentlich die abweichende Form der Stacheln genau zu reproduciren.

101

Lethrinus mahsena

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[illegible]

Lathrinus

B. 6; D. 10–9; A. 38; V. 1–5; P. 12; C. 3, 1, 8, 7, 1, 2

The head, which comprises a fourth of the fish, is slightly gibbous upward and forward of the eyes, caused by a slight depression on the occipital region. The upper line of profile, from the end of the snout to the interocular space, rises at an angle of about 38°. The eyes are large, approximating the upper line of profile, sub-circular in shape, and their greatest diameter as compared to the length of the head, is as two to nine. The posterior extremity of the maxillary is on a plain with the hinder nasal aperture. Both jaws are furnished with stout anterior canine-like teeth, followed by two patches of crowded small acute tubercular ones, and ten or eleven molars. The posterior nasal opening is subtriangular and the anterior one circular. The upper and lower outlines of the body are nearly similarly arched. The greatest depth

of the body is a little more than the length of the head. The median line of the body contains in a single row 42 scales, not enumerating the small irregularly disposed ones on the base of the caudal fin. 49 scales may be counted in the course of the lateral line, not including the small ones at its termination. There are 20 horizontal rows between the dorsal and ventral line, of which 5 are above the lateral line.

The dorsal fin commences above the base of the pectorals, and passes over a base half the length of the fish, excluding the caudal fin in the measurement. The first spine is half as long as the second, the others graduated, the third and fourth the highest, so that the spiny portion is arched in outline, and in height equal to one-third the length of the head. There is a well marked depression between the two portions, and the soft which is also slightly arched is posteriorly rounded off, and not so deep as the spiny portion. The anal fin is as long as the

soft dorsal, a trifle deeper, of the same outline, and the anterior spines are graduated. The large pectorals are sub-falciform, their pointed tips reaching as far as the vent. The ventrals are large, slightly pointed, and the caudal is strongly emarginate so that the lobes are sub-triangular.

The color of the dead fish, which is probably much changed, light yellowish gray, passing into white beneath, and olivaceous-green above. The scales are lighter margined, and those on the upper half with a pale central spot. Interior of the lips and interior of the mouth blood-red. Irides silvery, shaded with olive brown. Fins light reddish.

Length 14 inches

Hab. Hervey Isls.

102

Lethrinus sp.

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Sphaerodon grandoculis

~~Genus Sagropsis, Garrett~~

Body oblong-oval, sub-elliptical, compressed. Scales small, covering the cheeks, all the opercular pieces except the margin of the preopercle; also a supratympanic patch and minute ones on the caudal. Head short, rather obtuse. Mouth medial, slightly oblique; jaws even; lips fleshy. Three rows of large flat molars in each jaw, with elongate conical teeth in front. Branchiostegal rays six. A slight depression between the two portions of the dorsal; the spinous part the longer. Anal coterminal and as long as the soft part of the dorsal. Ventrals beneath the hinder base of the pectorals. Caudal forked.

~~Sagropsis obtusifrons, Garrett.~~

B. 6; D. 10-9; A. 3-9; V. 1-5; P. 14; C. 3, 1, 8, 7, 1, 2.

The head, which is one-fourth of the total length, is gibbous over the eyes. The interorbital space is depressed and wider than the orbits. Eyes large, oval, situated high on the head, rather nearer to the opercle corner than to

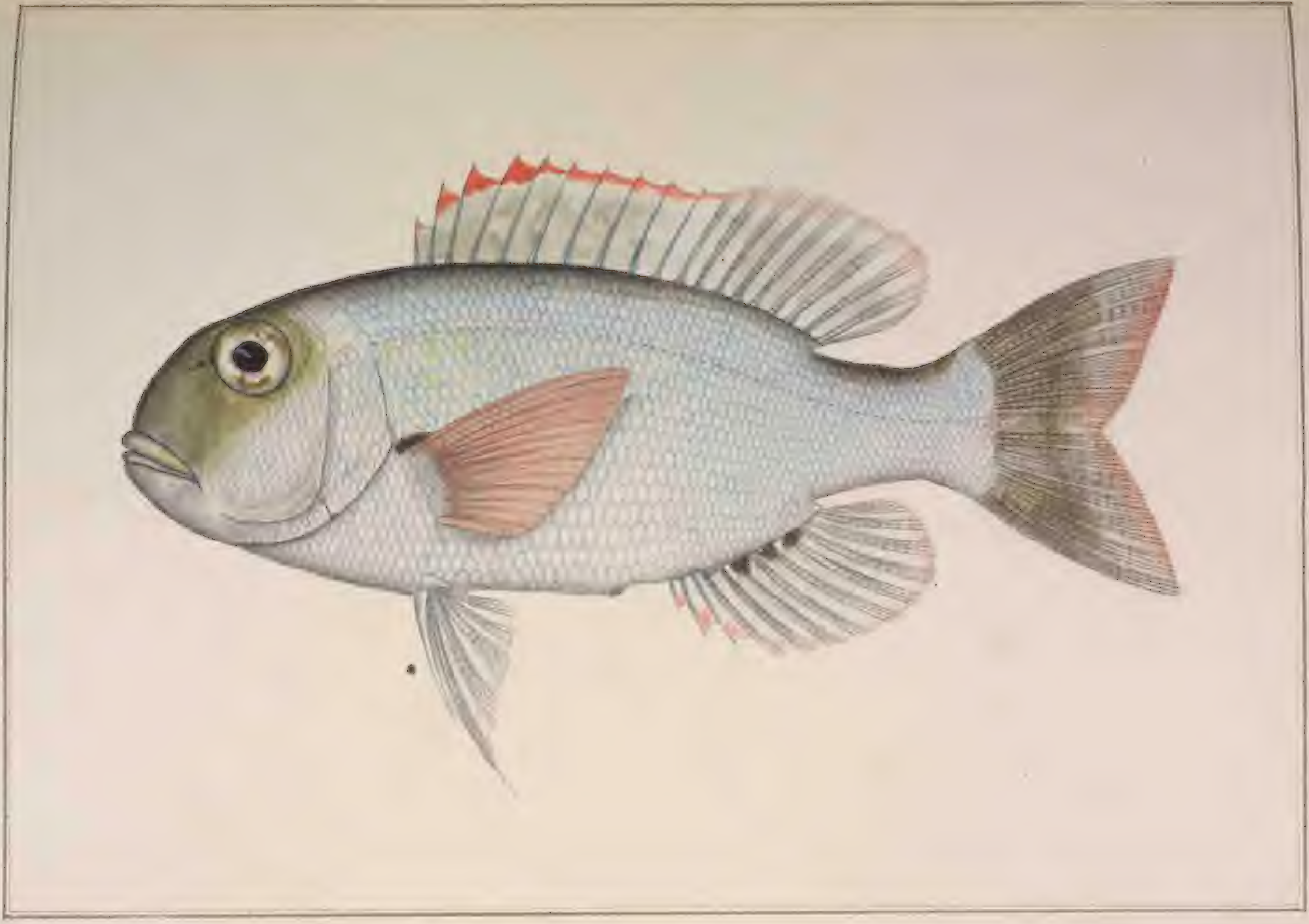
the end of the snout, and their greatest diameter is less than three and a half times in the length of the head. The hinder limit of the maxillary reaches a vertical line drawn just behind the anterior border of the orbit. Sixteen longitudinal rows of scales on the greatest depth of the body. Both dorsal and anal are posteriorly rounded off. Ventrals prolonged into a filament. Pectorals nearly as long as the head. Caudal forked for nearly half its length, the lobes triangular.

Color of the dead fish, bluish-steel above and silvery beneath. Head olive above. Irides silvery, varied with olive-yellow and violet. A blue-black spot marks the pectoral axilla. Fins pale steel-blue, more or less mottled with dusky olive, the vertical ones tinged with red along their margins, and the anal generally with three or four blackish spots along its base. Rays of the pectorals reddish.

Length, 16 inches.

Habitat.—Kingsmill Isls, Society Isls, Sandwich Isls, Hervey Isls.

Remarks.—An excellent fish, called "Mahamehatai" at Tahiti.



103

Sphaerodon grandoculis

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Pimelepterus fuscus

Pimelepterus No 177

B. 6; D. 11-12; A. 3-11; V. 1-5; P. 19; L. l. 41, 57, 62.

This species is of an oblong oval shape, and the dorsal outline is more arched than the ventral line. The greatest depth of the body equals nearly a third of the total length of the fish. The head comprises nearly a fifth of the length of the fish, and exhibits a slight concave depression above the eyes, which latter are rather large, circular, their diameter entering four and a half times in the length of head.

The dorsal fin arises posterior to the pectorals, rather low, and passes over a base nearly equal to half the length of the fish, caudal excluded. The sixth or seventh spine the tallest, which slightly overtops the soft portion, which latter is about the same length as the spinous portion and convex on the upper margin.

The anal fin extends over a base nearly equalling that of the soft dorsal, but extends more posterior, and is deeper than that fin, and tapers away posteriorly.

The ventrals are inserted a little posterior to the pectorals and when laid back reach half way to the anal fin.

The pectorals are rather small, and the caudal is deeply emarginate.

Color grayish silvery, olive brown above. Irides brownish. Caudal purple brown, the latter color also marks the outer half of both soft dorsal and anal. Spines broad steel blue clouded with purple brown.

Pectorals outer third pale yellowish, the middle pale purple brown and the basal part greyish silver. Ventrals mottled with white and brownish.

Length 22 inches.

Hab. Sandwich Isles.

Native name [illegible]

101

Pimelepterus fuscus

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Cirrhites forsteri

Cirrhites pantherinus, Lacep.

Perca maxillis aequalibus, Seba, Mus. Vol. 3, p. 77, pl. 27, fig. 12.
Sparus pantherinus, Lacep., Hist. des Poiss. Vol. 4, p. 160, pl. 6, fig. 1.
Cirrhites pantherinus, Cuv. et Val. Hist. Nat. des Poiss. Vol. 3, p. 70.
" " Lesson, Voy. Coquille, Zool. Vol. 2, p. 225, pl. 22. fig. 1.

B. 6; D. 10-11; A. 3-6; V. 1-5; P. 7-7; C. 4, 1, 7, 6, 1, 3.

The head, as compared to the total length, excluding the caudal is as one to three. The eyes are rather large, being one-sixth the length of the head. The preopercle is rounded and slightly dentated on its hinder edge. The upper part of the head and nape are strongly arched.

The dorsal fin arises a little in advance of the hinder termination of the opercular flap; its spiny portion is gently arched, the fourth spine the tallest. The soft dorsal tapers away posteriorly, but preserving a slightly convex outline and rounded off behind. The anal is shaped like the above fin.

Color: the anterior superior half of the body is dusky-fawn; the posterior

upper portion is nearly covered by a broad diffuse longitudinal black band, which even extends on the caudal fin, and shades off with yellowish-white beneath. Lower half of the body orange-yellow; the head and breast lead color. The back part of the head and the upper half of the body are closely maculated with small roundish black spots which have more or less a dash of lively red in them. Lower part of body longitudinally lineated with pale bluish lines which are articulated with darker. The breast is decorated with close, irregular broken narrow stripes consisting of black and red spots running into each other. The lower and anterior portions of the head, covered with small lively red spots, which more or less run into each other forming broken lines. Dorsal fin light red along its base; the spinous portion pale yellow, tinged with dusky above; the soft part is shaded off with blackish above the red basal color, the remainder of the membrane colorless with light red rays. The anal is mottled with violaceous, and its rays are soiled yellow. Pectorals and caudal have pale membranes and violet colored rays, the former generally have a few

blackish basal spots. Ventrals violaceous, with golden-yellow rays.

Length, 7 inches.

Habitat. Sandwich Isls, Kingsmill Isls, Society Isls, Mauritius, East Indies.

Remarks. At the Sandwich Isls, where this species is very rare, we obtained a single example from which our drawing and description was made. At the Society and Kingsmill Islands only two small specimens occurred to our notice. The varicolored body, particularly the posterior black stripe will distinguish it from the other Pacific species. Lesson's figure, in the Zoological plates, Voyage of the "Coquille", is not very good; it gives but a poor idea of the color.

105

Cirrhites forsteri

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Cirrhites semistriatus, Ths.

Cirrhites

D. 10-11; A. 3-6; V. 1-5; P. 7-7; C. 3, 1, 7, 6, 1, 2.

The general aspect of this species as seen in profile is somewhat similar to C. forsteri, both of which are not so high at the origin of the dorsal fin as the other Polynesian species. The greatest depth of the body enters three times and two-thirds in the total length, and the greatest thickness equals half the depth just alluded to. The head constitutes about two-seventh of the fish. The eyes are oval, rather large, their greatest diameter entering five times and a half in the length of the head. The hinder extremity of the maxillary touches a vertical line drawn just behind the anterior border of the orbit. The preopercle is slightly emarginate and feebly dentated above the sinus.

The dorsal fin is rather low, taking its origin above the end of the opercular flap, and its spinous portion is but little longer than the soft, which latter is a trifle the deepest and tapers away posteriorly. The anal in depth equals the length of its own base, the

former exceeding that of the soft dorsal. The caudal is posteriorly rounded.

Color: the upper half of the body is fawn-yellow, the back tinged with carnation, and rather closely maculated with small irregular blackish-brown spots, which become smaller and obsolete anteriorly. A broad ~~carnation band~~ longitudinal carnation band traverse the middle of the body from the head to the caudal fin, and depressing itself over the middle of the head. The lower half of the body is bluish-white, marked with seven or eight longitudinal yellow lines. Head reddish, with two or three faint bars on its upper posterior portion. Irides ruby-red. The spinous dorsal spotted with chrome yellow, and the rays are red. Soft dorsal and anal slightly tinged with chrome-yellow, particularly in their rays. Caudal and ventral rays yellow. Pectoral rays orange.

Length, 8 inches.

Habitat. Society Isls, Kingsmill Isls.

Remarks. A rare species, of which we have seen but three specimens.

Taf. 50. Fig. 1a.

106

Cirrhites hemistictus

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NATURAL HISTORY MUSEUM

Cirrhites polystictus, Gthr

Cirrhites

D. 10-11; A. 3-6; V. 1-5; P. 7-7; C. 5, 1, 7, 6, 1, 2.

The head comprises about one-third of the total length, caudal excluded. Eyes oval, their greatest diameter entering six times in the length of the head. The hinder end of the maxillary reaches a vertical passing through the center of the eye. The preopercle is slightly emarginate and not dentated. The greatest depth of the body falls a little short of the length of the head.

The dorsal fin commences immediately above the end of the opercular flap; its third or fourth spinous ray is the longest, and the general outline of that part of the fin is well arched. The soft dorsal is united to the spinous for about one-third its own height, and tapers away posteriorly. The depth and length of the anal are about equal, and tapers more rapidly than the fin above. The caudal is truncately rounded.

Color bluish-gray, becoming paler beneath. Head light brown. Every part of the body except the throat, closely maculated with small round purple

brown spots, which on the lower parts more or less unite forming broken longitudinal stripes. A rather large carnation spot on the lateral line beneath the hinder half of the spiny dorsal. Beneath the head dusky purple. Interior of the mouth and opercular bones vermilion-red. Irides silvery varied with light red. Spiny dorsal light steel, and closely maculated with small irregular reddish spots. The soft dorsal and anal have their basal halves spotted like the body on a nearly colorless ground, and their rays are reddish brown. Ventrals steel color, with olive-yellow rays. Pectorals steel-blue with red rays. Caudal spotted like the body, on its basal half, otherwise nearly colorless.

Length, 8 inches.

Habitat.—Kingsmill Isls, Society Isls.

Remarks.—A rare species. At the Kingsmill Isls, its name is "Tentawaiabo" at Tahiti it is called "Patui". They differ slightly in color.

Taf. 50. Fig. 2.

107

Cirrhites polystictus

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Cirrhites arcatus, Cuv. et Val.

Perca arcata, Solander, M.SS. A. 64.
Cirrhites arcatus, Cuv. et Val., Hist. Nat. des Poiss., Vol. 3, p. 74.
" " Lesson, Voy. Coquille, Zool., Vol. 2, p. 227.
" " Richardson, Voy. Samarang, Zool. Fishes, p. 26, pl. 8, fig. 3-5

B. 6; D. 10-11; A. 3-6; V. 1-5; P. 7-7; C. 4, 1, 7, 6, 1, 4.

The greatest depth of the body is just one-third of the total length of the fish, and the thickness is about one-third of its height. The head, which has a rather steep profile, enters three times and a half in the total length.

Color pale greenish grey with darker longitudinal lines along each row of scales, and large pale pink stripe posteriorly. Sutures of the mouth orange red. An arcuate orange, red and blue line posterior to the eye. Nasal tubes orange. Several orange red spots on the lower part of the gill covers. Irides varied with orange red. Pectorals pale amber yellow. Ventrals with colorless membrane and pale amber yellow rays. Spinous dorsal

pinky red shaded off with olive green above. Soft dorsal pinky red along the base and a dusky shade along the middle. Anal pale dusky. Caudal shaded with dusky and pinky.

Length 4 inches.

Hab.—Society Isls.

Cirrhites arcatus var.

Cirrhites propinqua, Garrett.

Perca? arcuata, Solander, MS. [illegible] 167, no. 6.

The upper profile, from the snout to the trunk of the tail is regularly arched. The general shape is oblong, and rather strongly compressed. The greatest height of the body, which takes place above the ventrals, equals less than a third of the total length. The head is contained three and one-third times in the total length. The eye is rather large, circular in shape; its diameter as compared to the length of the head is as one to four. The orbits rises above the line of profile, rendering the space between concave. The rounded preopercle is simple, with the exception of two minute dentations near the rounded corner. The hinder tip of the maxillary terminates in a plain with the posterior rim of the orbit. The oblique mouth has a moderate chavitune. The teeth in both jaws are disposed in closely set villiform bands, with an exterior row of conical ones, and two upper front canines. The opercular scales are larger than those on the cheek, which latter are disposed in six oblique rows, all having exiguous ones intermixed. Very small crowded scales cover all other parts of the head except maxillary. They may also be observed along the bases of all the vertical fins. Six longitudinal rows mark the space above the lateral line, which latter, consists of simple oblique tubes, and runs with a slight descent and nearly straight course to the base of the caudal

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The dorsal fin arises at a point a little in advance of the opercle corner. ~~and is the~~ The third spine is the tallest and the tenth is a little larger than the ninth. The spinous portion is united to the soft for nearly half the height of the latter. The soft dorsal, which rapidly tapers posteriorly, is higher than the spinous, which height nearly equals the length of its own base.

The anal fin commences a trifle nearer the opercular corner than the base of the caudal, but does not by considerable extend so far back as the fin above. Its height and length are about equal and rapidly taper posteriorly. The ventrals when laid back cover the anus with their tips; their length equals the depth of the anal. The lower pectoral rays project but little beyond their membrane. The caudal is rather large and posteriorly convex when expanded.

Color brownish slate, with about 16 obsolete darker longitudinal lines. A stripe bent like the letter U on the temporal region, the nasal [illegible] large spots on the interopercle, and interior of the mouth, orange red. Sides silvery, shaded with reddish. Spinous dorsal, caudal and basal portion of the second dorsal light red; the upper portion of the latter yellowish and dusky along the middle of the fin. The other fins are paler than that portion of the body whence they arise.

Length 5 in. Habitat. Sandwich Isles.

Cirrhites arcuatus

108

Taf. 49. fig. C.

109

Taf. 49. fig. B.

Cirrhites arcuatus

Crenichthys maculatus

Cirrhites No 480

D. 9–11, A. 3–6; V. 1–5; P. 7–8; C. 3, 1, 7, 6, 1, 2.

The greatest depth of the body and the length of the head, which are about equal, enters three times in the total length, caudal excluded. The eyes are oval in shape, their orbits rising above the upper line of profile, and their greatest diameter enters five times in the length of the head. The cornea is elliptical. The muzzle is rather obtuse, the upper jaw the longer, and the hinder tip of the maxillary extend back nearly on a plain with the centre of the eye. The preoperch is rounded, slightly sinuous and minutely dentated. The scales on the operch and body are large, those on the cheeks, preoperch and sub-operch are very small.

The dorsal fin commences over the hinder termination of the opercular flap; its spiny portion extends over a base equal to the length of the head, and the third or fourth spine is the tallest, which height enters three times in the length of the head. Its soft portion is about two thirds the length of the

spinous part, and the second ray which is the tallest equals nearly half the length of the head. It rapidly tapers away posteriorly so that the last ray is only little more than half as long as the second one.

The anal fin is very short on its base, but much deeper than the fin above. The caudal is truncate.

Color greenish gray, passing into gray beneath, and irregularly maculate with various shaped red and brown-red spots, some of which have darker centres. The upper part of the muzzle is dark violaceous, the cheeks and opercular pieces pale violet, obliquely striped with ochre-yellow. Beneath the head yellowish or buff yellow, with two or three leaden purple bars. The dorsal greenish gray, the spiny portion tipped with dusky and maculated with large diffuse brown-red spots. The soft dorsal is spotted with light red. The caudal is pinky red spotted with red. The anal is gray, with several large diffuse brown red spots and its spiny portion steel blue, with dusky tips. Pectorals pinky flesh and the ventrals steel blue with pinky rays. Length 9 inches.

Hab. Sandwich, Society and Cooks Isls.

Perhaps C. macnlosa, Bennett Zool. Journal

110

Cirrhites maculatus

Cirrhites melanotaenia. [marginal annotation]

Cirrhites dorsalis, Garrett.

D. 10-13; A. 3-5; V. 1-5; P. 8-6; C. 3, 1, 8, 7, 1, 2.

This little Cirrhites is rather strongly compressed and much arched on the dorsal region. The greatest depth of the body which is beneath the middle of the spiny dorsal is one-third of the total length. The head is short, and precipitately convex along its upper profile. Its length as compared to the entire fish is as two to nine. The eyes are large, sub-circular, their greatest diameter being one-third the length of the head. The small maxillary does not reach quite so far back as the center of the eye.

The dorsal fin commences above the base of the pectorals; its spiny portion which is much longer than the soft, is gently arched, and the rays are tipped with clusters of little filaments. The soft dorsal is similar to the spiny for more than half its own height and tapering posteriorly. The anal is deeper than the soft dorsal, Caudal convex along its hinder margin.

Color fine ruby-red. Blackish

along the dorsal region, which color is more or less diffused over the basal half of the dorsal fin, and round the eyes. Irides vermilion-red. Upper half of the dorsal and the caudal orange red. All the other fin pale red with ruby-red rays.

Length, 2 to 3 inches.

Habitat. Society Isls.

Remarks. We obtained two or three specimens of this remarkable species in clumps of coral. The drawing is enlarged.

Cirrhites melanotus

III

Family *Cirrhitidae*, Garrett.

Fishes of this family are characterized by their broad rounded pectorals, whose lower rays are stouter, not branched and extend a little beyond the membrane. Their gill are united under the throat by a broad isthmus.

Genus *Cirrhites*, Commerson.

Form oblong, compressed. Scales moderate; exiguous ones on the vertical fins, and intermixed with the larger ones on the head. Head abbreviately subconical; jaws sub-equal; lips fleshy, mouth moderate, oblique, teeth in villiform bands with larger ones intermixed. Orbits elevated above the line of profile. Anterior nostril with a tentacular appendage. Preopercle dentated. Opercle terminating in an obtuse angle. The two dorsals more or less united, the spinous the longer. Anal small, not approaching so near the caudal as the opposite fin. Caudal truncate or rounded. Ventral posterior to the pectorals.

Cirrhites cinctus

Cirrhites fasciatus, Bennett.

Cirrhites fasciatus, Bennett, Zool. Journ., vol. 4, p. 39.

D. 10–14; A. 3–6; V. 1–5; P. 5–6; 6, 5, 1, 7, 5, 1, 2.

The head comprises about a fourth of the entire length of the fish, and the diameter of the eyes bears about the same relation to the length of the head. The hinder tip of the maxillary is even with the anterior border of the orbit.

The dorsal fin passes over a base equal to half the total length of the fish. The spiny portion is arched, being deepest at the fifth ray. The soft portion of the fin is the deepest, and gradually tapers away posteriorly. Minute filaments may be observed at the tips of the spiny dorsal rays. The anal is deeper than long, and tapers more rapidly than the fin above. The undivided rays of the pectorals are prolonged far beyond their membranes. The caudal is truncate.

Color pale grayish, which gradually becomes carmine posteriorly. Sides with five vertical brown bands, which

are wider than their interspaces; the bands terminate on the lower third of the body. The upper part of the body between the bands is often dotted with vermillion-red and light green. Breast dotted with light red, blue and green intermixed. Head olive-brown above, more or less varied with dots like those on the breast. Fins carmine, paler towards their outer margins and the soft dorsal and anal dotted with deeper colored spots.

Length, 4 inches.

Habitat—Sandwich Isls.

Remarks—At the above locality where this species is very rare, we obtained two or three specimens. Its vernacular name is "Upu ka hai hai". Bennett's description being from a specimen which had been long in spirits was much changed in color. The vertical bands and carmine rays will readily distinguish it.

112

Cirrhites cinctus

47

bimacula, Jenkins

Cirrhites bioccellatus, Jerr.

D. 10-12; A. 3-6; V. 1-5; P. 7-5; C. 7, 4, 6, 6, 1, 7.

The general aspect of this small species is eliptically-oblong, with the dorsal outline a trifle more arched than the ventral region. The greatest depth of the body equals the length of the head, or just one-third the total length of the fish, excluding the caudal fin in the measurement. The greatest thickness equals half of the above mentioned depth. The head is depressed above, the muzzle pointed, and the hinder tip of the maxillary extends back a little posterior to the anterior limb of the orbit. The eyes are rather large, nearly circular, rising a little above the upper line of the head, and their diameter entering about four times in the length of the head, and once in advance of their own

orbit. The preoperculum is obtusely rounded and the upper half strongly denticulated.

The dorsal fin, which commences immediately over the base of the pectoral fin, is about equal height in its two portions, the anterior arched, each ray tipped with a little filament, and the posterior or soft portion tapers away towards the tail. The caudal is truncate, the anal nearly as deep as long, and each spine tipped with a small filament as in the fin above. The ventrals when closely appressed to the abdomen do not quite reach as far as the anal fin. The pectorals have the five lower rays prolonged so that the tips of the upper two extend back as far as the anal fin, the lower three gradually becoming shorter.

Color brownish-red, the

body ornamented with sub-vertical narrow greyish-white bands, which are more or less interrupted and those on the middle confluent. A large black spot encircled with whitish marks the opercle, and a similar one just beneath the middle base of the soft dorsal fin.*

Length 52, depth 14 Mill.

Hab.— Tahaa, Society Isls.

* Irides light red. Fins all more or less tinged with light red.

2

113

Cirrhites bimacula

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cm
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Cirrhites sp. dub.
an = oxyrhynchus, Blkr!

Cirrhites productus, Garrett.

D. 10–12; A. 3–6; V. 1–5; P. 9–5; C. 3, 1, 7, 7, 1, 3.

The greatest depth of the body, which takes place at the origin of the dorsal fin, nearly equals the length of the head, or, more exactly two-seventh of the entire length of the fish. The greatest diameter of the eyes as compared to the length of the head are nearly as one to four. The snout is more pointed than usual. The hinder tip of the maxillary reaches posteriorly to a vertical line drawn just behind the anterior limb of the orbit. Preoperale strongly dentated in its upper hinder margin.

The dorsal fin arises a trifle in advance of the opercular flap; its spiny portion is regularly arched, being most elevated at its middle rays, which are all tipped with little bundles of small filaments. The soft dorsal, which is connected to the spinous for about half its own height, is a little the deepest and tapering backwards as usual in the genus. The anal is deeper than long. The unbranched pectoral rays are very much prolonged beyond their memb-

rames, one of which reaches as far back as the anal fin. Caudal truncate.

Color light brown above and bluish-white beneath. The flanks are marked with about ten vertical reddish brown more or less interrupted irregular bars. Two small blackish spots near the end of the dorsal fin, and one shaded off with reddish brown marks the center of the opercle. Three short vittae on the anterior half of the head. Irides carnation. Fins colorless.

Length, 3 inches.

Habitat.— Society Isls.

Remarks.— A solitary example of the species occurred in a clump of coral.

54

114

? Cirrhites oxyrhynchus

Cheilodactylus vittatus, Garrett
Proc. Cal. Acad. Sciences, Vol. 3, p. 103.
B. 6; D. 17-30; A. 3-8; V. 1-5; P. 8-6; C. 5, 1, 7, 6, 1, 4.

The height of the body is a trifle less than one third of the total length. The upper profile rises in a convex line from the snout to the occipital region, whence it suddenly ascends in a nearly vertical curve, giving that portion of the fish a strongly gibbous appearance. The body rapidly tapers posteriorly, though preserving a slightly convex outline. The head enters nearly four and a half times in the entire length. The eyes are large, sub-circular in shape, even with the line of profile, and their greatest diameter is nearly one-third the length of the head. They are placed nearer the origin of the lateral line than the end of the snout. The small maxillary bone extends back as far as the anterior margin of the eye.

The dorsal fin takes its origin immediately above the posterior limb of the orbit and terminates within one diameter of the eye from the caudal fin. Its three anterior rays are very small, and the fourth which is the tallest, is one-third as long as the base of the whole fin or equal to two-third the height of the body. Posteriorly the spiny rays diminish in altitude so that the last one is shorter than the succeeding soft ray. The soft portion of the fin is comparatively low, gently convex along its upper edge, and is equally as long as the spinous part. The anal fin is small, being inserted just in advance

of the middle of the soft portion of the dorsal. Its extreme margin is slightly concave and the rays rapidly diminish in length posteriorly. The ventrals when laid back reach as far as the anal fin. The second simple pectoral ray extends as far back as the vent. The caudal which is deeply forked, has its lobes rounded off.

Color grayish silvery, and ornamented with five oblique blackish-brown bands which are disposed as follows: one extends from the snout to the preopercular margin, the second starts from the eye and terminates on the pectoral base, the third, which passes over the occipital region, extends below the pectoral axilla; the fourth which is much broader, starts from the origin of the dorsal fin, curves downward and backward, becoming wider in its descent and passes beneath the abdomen; The fifth one commences on the upper anterior half of the spinous dorsal, extends along the back to near the termination of that fin. Three irregular pale spots may be observed on the dorsal band, and three large blackish-brown spots on the caudal trunk. The opercular flap and snout tinged with orange-red. The interorbital space is marked with two transverse brownish-red bands. Iridis yellowish silvery. That portion of the dorsal fin anterior to the fifth band is white, the remainder together with the anal and caudal, light yellowish the latter tipped with blackish-brown. The pectoral are orange-red and the ventrals are deep blackish-brown.

Length 7 inches

Hab.— Sandwich Isls

An extremely rare fish of which the solitary specimen now before me is the only example that has to my notice. It is the more interesting in a geographical point of view, as being the only species — as near as I can ascertain — recorded from the Polynesian Seas. Sir John Richardson in his interesting "Notices of Australian Fishes" published in the "Proceedings of the Zoological Society of London" describes, and gives a list of thirteen species. Nine of them occurs in the Australian Seas, one from China and Japan, two from the Cape of Good Hope, and one from Tristan d'Acunha. In the number and arrangement of the fasciæ, our fish closely resembles _C. gibbosus_, Sol., (_Chaetodon_) from Van Dieman's Land. The latter species is less gibbous, the eyes smaller, the soft part of the dorsal fin shorter, and the caudal forks are more pointed than in C. _vittatus_.

Taf 51. Fig. B.

Chilodactylus vittatus

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